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MCI pledges switched T-1, T-3 services

By Anita Taff
Washington Bureau Chief

SAN DIEGO — MCI Communications Corp. last week announced it will roll out switched T-1 and T-3 services beginning in the third quarter of 1991 as the first offerings in a new family of data services.

The Virtual Private Data Services (VPDS), introduced at the Tele-Communications Association, Inc. conference here, will give users — that cannot cost-justify dedicated facilities — access to high-capacity data services on an ad hoc basis.

MCI said it expects the switched T-1 and T-3 services, initially available only in the U.S., to open the door to a host of sophisticated data applications that are beyond the financial means of most users today.

Possible applications for the T-1 and T-3 services include local-area network interconnection and transmission of exceptionally large data files used in applications such as climate modeling and design simulation.

IBM and Cray Research, Inc. participated in a joint demonstration of the technology at the conference. Cray demonstrated how customers could remotely access supercomputers to perform com-

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John Holmbad, left, and Floyd Trogon discuss Sprint Data Group's plans to launch a wide-area network service based on frame relay.

Firm seeks market edge with videoconferencing

By Jim Brown
Senior Editor

ARLINGTON, Texas — Halliburton Co. last week announced that it will install 30 PictureTel Corp. videoconferencing systems to improve customer relations and cut the cost of providing oil exploration, drilling and plant construction services.

While other users envision videoconferencing as a means to slash travel costs, Halliburton said it expects the technology to provide a competitive edge.

"It's the timeliness in delivery of service and an enhanced way to deliver service that we're after," said Thomas Woods, director of information services at Halliburton's Information Ser-

vices Center here.

Halliburton is installing the PictureTel full-motion videoconferencing systems — which also support the simultaneous exchange of graphical images — at 30 of its locations worldwide and is developing plans to dispatch them to drilling sites when needed.

Offices in Alhambra, Calif., Houston, Kirkland, Wash., and Mobile, Ala., have already been equipped with the systems, and a company office in London will receive a unit this week.

Although Halliburton will use the videoconferencing systems to bring managers face-to-face more often, the network will also

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US Sprint unleashes frame relay service

Carrier says offering will enable users to connect LANs over wide areas, support broadband ISDN.

By Bob Wallace
Senior Editor

SAN DIEGO — US Sprint Communications Co.'s data communications group last week became the first long-haul carrier to unveil plans for a data network service based on the emerging frame relay standard.

Sprint Data Group, formerly Telenet Communications Corp., said at the annual Tele-Communications Association, Inc. conference here that it will offer the service throughout its international network in the third quarter of 1991.

Frame relay services will provide users with a more efficient means of supporting emerging wide-area data communications requirements, such as the need to interconnect geographically dispersed local-area networks. They will also pave the way for fast packet services such as broadband Integrated Services Digital Networks.

"It's paramount that we provide our customers [with] a migration path to future technologies and net services," said Dave Dorman, president of US Sprint's Business Markets Group. "Frame relay will provide users with higher speed, more cost-effective solutions for their data communications requirements and access to future services."

Frame relay is an emerging standard that defines how data packets are transmitted between devices such as LAN bridges or routers

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Health care industry Rx: uniform EDI

By Bob Brown
Senior Editor

LITTLE ROCK, Ark. — A group called the Health Industry EDI Project Team is funding development of an EDI implementation strategy for suppliers to the health care industry, *Network World* has learned.

The effort, which has the backing of purchasing consortia representing 3,500 hospitals nationwide, is being hailed by observers as the largest show of support for electronic data interchange by a single industry.

Widespread adoption of EDI standards by members of the health care industry would help lower costs for hospitals and expand their buying options by enabling them to deal directly with more suppliers.

A uniform EDI strategy could also benefit hospital purchasing groups, 22 of which formed the EDI Project Team. Use of EDI by suppliers would help the purchases

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NETLINE



A NEWBRIDGE MUX interface combines unused bandwidth from many T-1 lines to provide support for high-bandwidth applications. Page 2.

FURNITURE MAKER Haworth cuts over a cost-saving EDI net. Page 2.

RACAL INTERLAN'S intelligent wiring hub also acts as a terminal server. Page 2.

AT&T PLANS TO EXPAND its Global SDN service to more than a dozen additional countries. Page 4.

AMDAHL BOLSTERS UNIX support on its mainframes, adds new FEPs. Page 4.

SEN. HOLLINGS agrees to revise his 'free the Bells' bill by revamping the 'made-in-America' clause. Page 4.

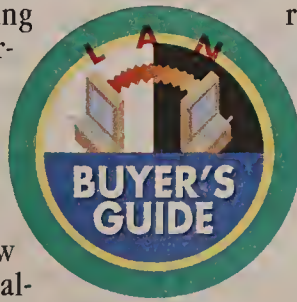
FEATURE



Interoperability is key to LAN operating systems

By Steven Guengerich
Special to Network World

It's time to look beyond such old simplicities as personal computer networking and microcomputer-to-host links. Instead, one of the most interesting and arduous tasks in networking today is deciding how best to integrate local-area networks — not merely with one another, but also with the installed base of minicomputers and mainframes.



Today's network managers at large organizations must deal with multiple LANs from multiple vendors, which is a direct result of decentralized purchasing of applications and computer system resources. Current LAN products must interoperate to survive.

At the application level, electronic mail is the area in which LAN interoperability has progressed most.

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Newbridge offers card that uses idle T-1 bandwidth

Virtual Channel Card for company's mux lets users tap unused capacity rather than add T-1 lines.

By Tom Smith
New Products Editor

SAN DIEGO — Newbridge Networks, Inc. last week announced an interface for its T-1 multiplexers that combines unused bandwidth from multiple T-1 lines to support applications such as local-area network bridging and videoconferencing.

Introduced at last week's Telecommunications Association, Inc. show here, the Virtual Channel Card will allow users to reallocate idle bandwidth on existing circuits for bandwidth-intensive applications, rather than installing additional T-1 lines.

Newbridge also announced optional software that lets the

company's OS/2-based network management system pass alarms to and receive commands from AT&T's Accumaster Integrator.

Creating virtual circuits

The Virtual Channel Card is a single interface card that resides in the 3600 MainStreet multiplexer, which has a maximum of 128 expansion slots and supports as many as 256 T-1 lines.

Software on the interface will locate unused bandwidth supported by the 3600 and distribute portions of a data transmission among available 64K bit/sec DS0 or T-1 circuits, which carry the data to its destination.

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Furniture maker rolls out cost-cutting EDI network

Net will also speed company's order processing.

By Bob Brown
Senior Editor

HOLLAND, Mich. — Haworth, Inc., one of the world's largest manufacturers of office furniture, recently cut over an electronic data interchange network designed to save the company \$600,000 a year by 1991.

Although still in the early roll-out stages, Haworth plans to extend its use of EDI to a worldwide net of more than 300 furniture dealers, as well as to suppliers.

The primary goal of Haworth's EDI network, which the company refers to as an electronic order processing net, is to speed order handling and reduce order processing costs, said Hal

Eckel, director of MIS. This is expected to give Haworth a competitive edge with dealers that sell both Haworth furniture and competing products.

"If it is easier for a dealer to process an order with us," Eckel said, "we would expect they would take that path instead of one that is more complex."

Haworth, which will sink about \$400,000 into EDI, has an aggressive network deployment schedule. The company anticipates that about 80% of its orders will be processed on-line by mid-1991, compared with the 5% that are processed electronically today.

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Racal InterLan wiring hub doubles as terminal server

By John Dix
Executive Editor

BOXBOROUGH, Mass. — Racal InterLan last week entered the market for intelligent wiring hubs with the introduction of a high-capacity device that offers a new twist: Besides supporting standard 10BaseT Ethernet technology, the hub provides asynchronous terminal serving capabilities.

The modular Internext 5000 Communications System (INX-5000) enables users to support personal computer and terminal connections from the same hub and manage those connections using the Simple Network Man-

agement Protocol (SNMP).

The device supports a maximum of 156 10BaseT ports, 208 terminal ports or a mix of the two.

Over time, the INX5000 will be enhanced to support other connectivity options, including token-ring and Fiber Distributed Data Interface LANs, as well as bridging, routing and gateway functions, according to Charles Dillon, director of systems products.

Like wiring products from Cabletron Systems, Inc. and Syn-Optics Communications, Inc., the INX5000 is intended to be used as

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Briefs

Nynex bids south of the border. Nynex Corp. last week announced it is teaming up with Canadian telecommunications giant BCE, Inc. and a Mexican investment firm, Casa de Bolsa Inverlat Associates, to bid for a controlling stake in Mexico's national carrier, Telefonos de Mexico S.A. de C.V. (TelMex). The Mexican government hopes to sell a 20.4% share in the carrier, representing slightly more than half of all full-voting stock, to a consortium of Mexican nationals and foreign telephone companies by year end. A BCE spokesman said the consortium has not decided how much to bid but the market value of the stake would be about one-fifth of the estimated \$7 billion total value of TelMex.

Legislators talk tough about 900. The House Telecommunications and Finance Subcommittee last week held a hearing on a bill recently introduced by Rep. Bart Gordon (D-Tenn.) that would broadly regulate the 900 services industry. Angered by constituents' stories of children running up bills responding to some TV advertisements and other deceptive practices, House members showed enthusiasm for proposals in "The Telephone Consumer Assistance Act." The bill would require service providers to make it possible for consumers to block the placement of 900 calls, require a message that disclosed service costs and provide a onetime forgiveness for customer charges.

Free net management service. Pacific Bell last week said it will offer by year end a free service that lets users order and test services — such as Centrex and 800 lines — and issue trouble reports from a terminal on-site. Because Pacific Bell's Service Manager system will enable customers to access existing customer support systems electronically, the carrier can offer the service at no charge. Pacific Bell anticipates the greatest demand for the service to come from Centrex customers.

Timeplex launches user group. Timeplex, Inc. last week announced the formation of a user group called the Timeplex Users Network (TUNE). The group's mission is to provide a forum for Timeplex customers to influence product development, stay current with Timeplex's product releases and strategic direction, and share information and experiences. TUNE is planning to hold its

first annual conference in early 1991. For more information, call (201) 573-6476.

Metcalf takes advisory role. Robert Metcalfe, Ethernet inventor and 3Com Corp. founder, last week was named chief advisor to Patriot Partners, a joint venture of IBM and Metaphor Computer Systems, Inc. Patriot Partners was formed last month to create application system software designed to work with multiple networks and operating systems, including OS/2 and Unix. Metcalfe said he accepted the post because "Patriot is a long-term project that will break new ground in application development, multimedia, application integration and user programmability."

Video to the U.S.S.R. AT&T last week introduced the first international videoconferencing service between the U.S. and the Soviet Union. The first call from New York to Moscow, transmitted via AT&T's International Business Videoconferencing Service, was held between Sam Willcoxon, president of AT&T's International Group, and Vladimir Ivanovich Glinka, minister of communications for the U.S.S.R. The new videoconferencing service uses AT&T's International Accunet Reserved Digital Service, available to customers on a reserved basis.

Northern Tel to trial frame relay net. Northern Telecom, Inc. last week at the Telecommunications Association, Inc. conference in San Diego announced plans to develop a frame relay interface for its DPN-100 line of packet switches. The packet switches will implement a frame relay interface that conforms with a specification Northern Telecom helped develop with Cisco Systems, Inc., Digital Equipment Corp. and StrataCom, Inc. The company intends to hold customer trials using frame relay for virtual private-line communications at T-1 speeds beginning next year.

GEIS offers 9.6K access. GE Information Services is scheduled to announce today 9.6K bit/sec asynchronous access to its public data net from 40 North American cities. GEIS is also expected to announce it is field-testing 9.6K bit/sec support for the Synchronous Data Link Control and Binary Synchronous Communications protocols with plans to introduce those services in 1991.

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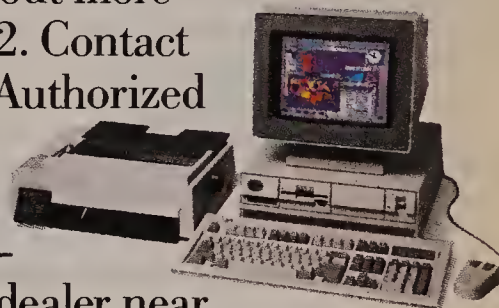
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AT&T to reach out, touch new countries with GSDN

By Bob Wallace
Senior Editor

SAN DIEGO — AT&T announced at the Tele-Communications Association, Inc.'s annual conference here last week plans to extend its Global Software-Defined Network (GSDN) service to more than a dozen new countries during the next two years.

AT&T said it will extend GSDN into Belgium, Canada, France and Japan by the end of next year, raising the number of countries in which the service is available to six. AT&T previously offered GSDN only to Australia and the U.K.

The carrier said it will offer GSDN to nine other countries within two years.

GSDN enables users to build virtual networks comprising domestic and international sites. It supports such standard SDN features as seven- and 10-digit dialing plans, account codes, authorization codes and detailed

management reports.

GSDN, which is priced 50% to 60% below standard AT&T long-distance rates, is a cost-effective international calling alternative for companies with more than two hours a day of point-to-point international long distance, according to the carrier.

Agreements abroad

AT&T said it is offering the services in conjunction with France Telecom in Paris, Kokusai Denshin Denwa, Ltd. in Tokyo, Regie des Telegraphes et des Telephones in Brussels, Belgium, and Unitel Communications, Inc. in Toronto.

In addition, AT&T, which currently offers GSDN interconnection in the U.K. with British Telecommunications PLC's International CityDirect Service, signed an agreement with that carrier to connect to its International FeatureNet service.

Unlike AT&T's previous con-

nection to British Telecom's City-Direct Service, which extended GSDN virtual network links into London, International FeatureNet will give users virtual net capabilities throughout the U.K.

MCI Communications Corp. recently announced plans to link its International Virtual Network service with International FeatureNet as well.

International FeatureNet will also provide GSDN subscribers International Direct Dial (IDD) access to all other countries served by British Telecom, as well as access to other virtual network services overseas.

The GSDN/International FeatureNet connection will support voice, facsimile and data communications at speeds up to 9.6K bit/sec.

AT&T SDN and Virtual Telecommunications Network Service subscribers can utilize existing dedicated links to AT&T points of presence to access GSDN. Other firms can use dedicated private lines to the nearest AT&T GSDN gateway switch. Users must maintain dedicated lines to the corresponding network in

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Network World names Strauss features editor

Network World is proud to announce the hiring of Paul Strauss as features editor and the promotion of Bruce Guptill from associate features editor to managing editor of features.

Former Features Editor Steve Moore, who was with *Network World* since its inception in 1986, has been named managing director of *Global Networks*, a new *Network World*, Inc. magazine serving global network managers worldwide. *Global Networks* will debut in the first quarter of 1991.

Strauss comes to *Network World* from *Data Communications* magazine, where he was a senior editor. He also pre-

viously served as managing editor of "The Business International Money Report," associate editor of *Institutional Investor* and managing editor of periodicals for Warren, Gorham & Lamont, Inc., a New York publishing company.

Strauss will work closely with Guptill and the rest of the features staff to shape the editorial focus of the publication's features section.

Guptill, who has been with *Network World* since 1987, was promoted to managing editor of features in recognition of his leadership ability and work in recruiting topflight contributing editors. □

Amdahl ups Unix support, unveils FEP line for UTS

By Jim Brown
Senior Editor

SUNNYVALE, Calif. — Amdahl Corp. last week improved support for Unix on its IBM-compatible mainframes with the release of a new version of its UTS operating system and announced its first line of front-end processors designed to work with UTS.

In addition to performance gains and added security, UTS Release 2.1 supports new communications facilities, including the ability to make an Amdahl host running UTS appear as a peer node to IBM hosts running MVS or VM.

This enables IBM 3270 terminals attached to an MVS or VM host to access applications and data on UTS-based mainframes. Likewise, asynchronous terminals attached to a UTS host can access applications and data on MVS or VM machines.

First-time users of UTS must pay a onetime license charge of \$20,000 for the software. Monthly license fees for new users and customers looking to upgrade range from \$4,000 to \$25,000. The software is expected to be

available in the first quarter of next year.

The new front-end processor line, the 4655 series, is designed to off-load protocol processing chores from UTS-based hosts. The front ends support asynchronous devices and those linked via X.25 circuits, and forward data to the host via a 3M byte/sec block multiplexer channel.

Amdahl previously sold a version of its IBM-compatible 4705 front-end processor for use with UTS-based hosts that required the host to perform protocol processing.

Amdahl is offering three models of the 4655. The 4655-100 supports either 256 asynchronous devices, each of which can operate at up to 19.2K bit/sec, or a maximum of 16 X.25 links operating at up to 64K bit/sec each.

The 4655-200 can be configured to support 512 asynchronous devices or 32 X.25 circuits. The 4655-300 can support 768 asynchronous devices and offers no support for X.25.

The 4655 should be available in the first quarter of next year for \$85,000 to \$384,000. □

Restrictions may be eased in attempt to free the Bells

Bill's domestic provision could be eliminated.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — In an attempt to get his bill passed before Congress adjourns in mid-October, Sen. Ernest Hollings (D-S.C.) last week agreed to revise the proposed legislation designed to let the RBHCs engage in the research and manufacturing of telephone equipment.

Hollings is prepared to alter the bill, called the "Telecommunications Equipment Research and Manufacturing Competition Act," by changing its original "made in America" provision and substituting more lenient language allowing off-shore production of some components.

The regional Bell holding companies are currently prohibited from engaging in research and manufacturing of equipment under the Modified Final Judgment's line-of-business restrictions.

Last May, the bill made history as the first "free the Bells" bill to successfully make it out of a congressional committee. Hollings is determined to see that the bill makes it through a Senate vote, and perhaps even a House vote, before Congress adjourns, according to an aide to the senator.

In order to pick up support, Hollings is willing to throw out the made in America provision, the aide said.

The change would mark a con-

siderable departure from the original intent of the bill, which was to boost domestic production of communications equipment by unleashing the creative potential

Telecommunications Equipment Research and Manufacturing Competition Act

Supporters

Ameritech
Bell Atlantic Corp.
BellSouth Corp.
Nynex Corp.
Pacific Telesis Group
Southwestern Bell Corp.
US West, Inc.

Opponents

AT&T
Independent Data Communications Manufacturers Association, Inc.
North American Telecommunications Association
Telecommunications Industry Association

SOURCE: DEMOCRATIC POLICY COMMITTEE, U.S. SENATE
GRAPHIC BY SUSAN J. CHAMPENY

of the RBHCs.

Because he was worried that the RBHCs might move production offshore, lessening the gains for U.S. workers, Hollings included the requirement that the RBHCs must manufacture through affiliates in the U.S. and use U.S.-made components.

The domestic content provision has incited opposition, in particular from the office of the U.S Trade Representative, which says the provision undermines U.S. efforts to persuade other countries to engage in open, fully competitive markets.

Under the new proposal, the bill would be amended to allow 40% of the equipment manufactured by RBHC affiliates to be produced outside of the country. The amended bill would also ask the RBHCs to "make a good faith effort to obtain components from U.S. manufacturers."

The battle ahead

Last week, Hollings and his staff were furiously canvassing for Senate support in an effort to move the bill to the Senate floor for a vote before Congress breaks.

But even if Hollings manages to pick up the majority he needs for a vote, he still faces stiff opposition from Sen. Howard Metzenbaum (D-Ohio), chairman of the Subcommittee on Antitrust, Monopolies and Business Rights of the Senate Committee on the Judiciary.

Metzenbaum is prepared to block the bill from coming to a vote until the legislation is reviewed by his subcommittee, according to a Metzenbaum aide.

"It's a piece of legislation to appeal the largest antitrust decision in history," the aide said. "Sen. Metzenbaum thinks it's the responsibility and the jurisdiction of the Antitrust Subcommittee to review such legislation."

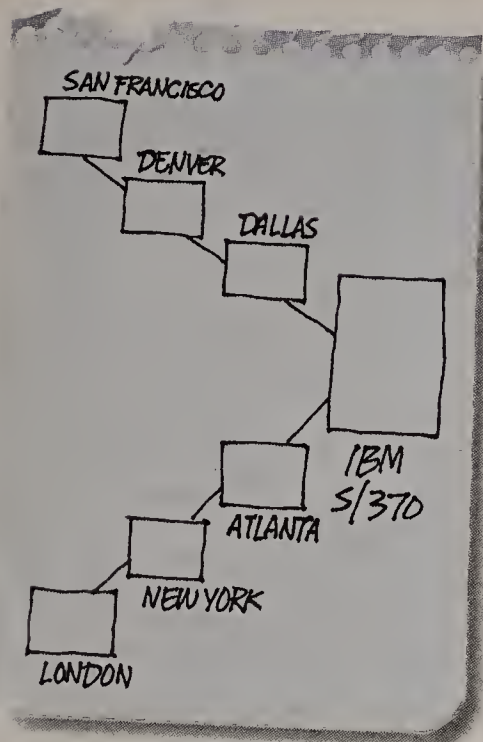
Hollings and his staff are working to reach an understanding with Metzenbaum, the Hollings aide said. □

Corrections: In the story "Graphical user interface key feature of Xerox pack" (NW, Sept. 24), the prices for Xerox Corp.'s GlobalView products were incorrectly listed. The correct prices for GlobalView are \$9,995 for the version that runs on a Sun Microsystems, Inc. SPARCstation and \$3,995 for the personal computer version.

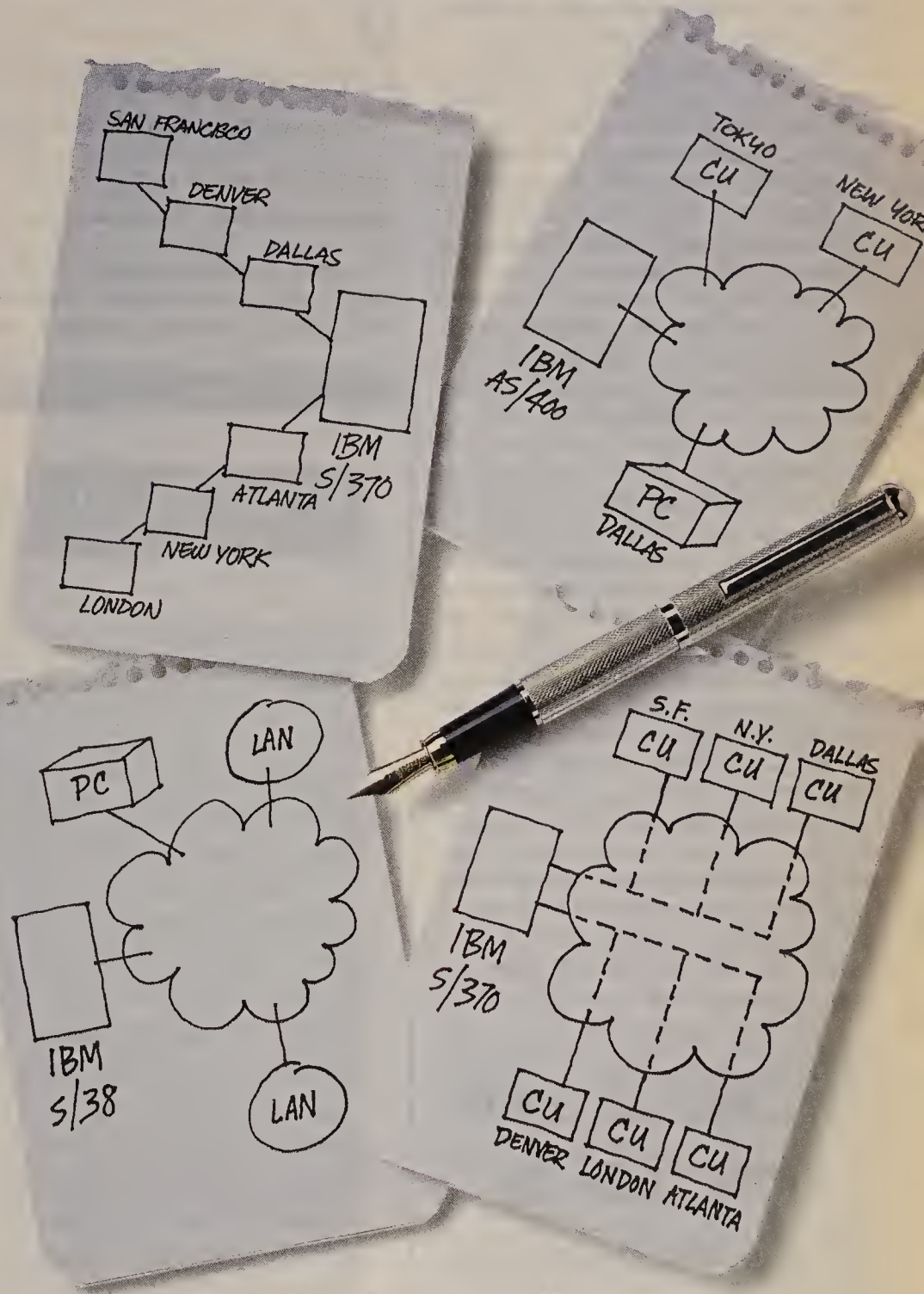
The story "Videoconference standards to bow with short-

comings" (NW, Sept. 10) incorrectly stated that the initial CCITT Px64 standards will not support point-to-point video-conference links. Actually, the standards will not initially support interactive videoconferences between more than two systems. Also, PictureTel Corp. is the market leader in videoconferencing based on the number of shipped video coder/decoders, not revenues. *Network World* regrets these errors.

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US Sprint Multidrop

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IT'S A NEW WORLD.SM

US Sprint unleashes frame relay service

continued from page 1

and T-1 multiplexers, packet switches or central office telephone switches.

Frame relay uses packets of variable length with a 16-bit header that includes flow control and routing information.

Error correction and flow control are handled at network endpoints, in contrast with X.25, which requires error correction at every node. This increases performance and reduces bandwidth requirements, which in turn cuts communications costs and lessens the number of packet handling devices needed in a network.

"Frame relay is a technology that could enable us to operate our networks more efficiently," said Raymond Beaven, telecommunications director for LTV Steel Company, Inc. in Cleveland.

The service

Sprint Data's frame relay service will be based on an upgraded version of the company's TP4900 packet switches and is scheduled to be generally available in the third quarter of 1991 through more than 200 Sprint Data points of presence in the U.S., Japan and the U.K. Companies can use T-1, as well as 56K and 64K bit/sec fractional T-1 links to access the service.

Sprint Data plans to deploy TP4900s throughout its network, a project that is now one-third completed. The company will then roll out a new release of the switch software that supports T-1 and frame relay. Once completed, the switches will be able to simultaneously support frame relay and X.25 traffic. In large locations, separate network switches will be

dedicated to either technology, while in outlying areas, a single switch will be used to support both services.

Analysts applauded Sprint Data's service strategy.

industry analyst with Dataquest, Inc., a consultancy in San Jose, Calif. "Heavy packet-switching users can run X.25 and frame relay in tandem and later switch to frame relay if needed."

Sprint Data's frame relay service will be based on an upgraded version of the company's TP4900 packet switches.

▲▲▲

"Sprint Data is offering users a well thought out migration path from X.25 to frame relay," said Steve Sazegari, senior

The company plans to cut-over next month an international frame relay demonstration network to gain some outside-

the-lab experience.

John Holmbad, vice-president and general manager of private networking with Sprint Data, said the network will consist of TP4900s equipped with the frame relay interface and its TP7900 fast packet multiplexer. The net will link Sprint Data sites in Burlingame, Calif., and Reston, Va., to an office in Basingstoke, England, via the Trans-Atlantic Telecommunications-8 fiber cable.

Sprint Data Senior Vice-President Floyd Trogdon said the firm will establish early next year a program to certify other vendors' frame relay products for use with its service.

Cisco Systems, Inc., Proteon, Inc., 3Com Corp., StrataCom, Inc. and Timeplex, Inc. have indicated they will partici-

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intelligence for faster rerouting, more efficient bandwidth utilization, and better control. Guaranteed response by local field service engineers. And comprehensive service

US Sprint adds new dial-up data capability

SAN DIEGO — US Sprint Communications Co. last week announced general availability of an enhanced Virtual Private Network (VPN) capability that lets users aggregate the capacity of multiple switched 56K bit/sec channels.

The technology, called NX56 for N times 56K bit/sec, was announced at the Tele-Communications Association, Inc.'s annual conference here. It is intended to support applications such as videoconferencing and imaging, as well as computer-aided design and manufacturing.

Glenn Hall, access technologies director for US Sprint, said the capability lets users dial up one to eight 56K bit/sec channels to create high-capacity links at speeds up to 448K bit/sec.

The technology will eventually enable users to dial up a maximum of 24 56K bit/sec channels. Hall said the capability will be offered to non-VPN customers beginning next year.

Users need dedicated T-1 access to a US Sprint point of presence and an intelligent T-1 multiplexer certified for use with the capability, Hall said. The carrier demonstrated NX56 in its booth using a multiplexer made by Digital Access Corp. of Reston, Va.

— Bob Wallace

pate in the certification program, Trogon said. "This program is a major impetus for interoperability between frame relay products, which is essential," he said.

Two of those five vendors — Cisco Systems and StrataCom — together with DEC and Northern Telecom, Inc. recently announced they will create an interim frame relay specification that vendors can follow while waiting for finalization of the real standard.

Sprint Data has not yet decided if it will join the group.

Besides the new service, Sprint Data plans to sell frame relay-equipped packet switches to companies with private data networks, value-added network operators and foreign post, telegraph and telephone administrations. ☐

Firm seeks market edge

continued from page 1

enable the company to improve contact with customers, many of whom also have PictureTel equipment. Halliburton said it plans to loan units to customers that want to interact via video but do not have the equipment.

The units will help Halliburton and its customers make decisions and resolve problems more quickly, Woods said, cutting the time it takes to complete oil exploration or approve plant designs, thereby reducing costs.

Halliburton, for example, is planning to use the system to speed delivery of computer graphics images, such as geological

formations gathered by electronic sensors attached to drilling equipment, and other technical diagrams to customers.

Armed with this information, geologists at the customer site will be able to tell Halliburton whether drilling should proceed at that site or a new one.

Customers currently must either bear the cost of sending their own staff to a well site to review drilling test results or incur the expense of an idle drilling rig while they wait days for printed copies of color graphics images from the site.

Halliburton hopes to benefit from videoconferencing by enabling on-site engineers to gain customer approval to conduct advanced drilling tests by transmitting the graphical images.

"We have the chance to sell additional

services while we're at the job site," Woods said.

The company said it also hopes to speed the process of gaining customer approval for plant designs. With the PictureTel units, customers can examine plant designs transmitted during the videoconference and simultaneously talk to design engineers at Halliburton's office. Any changes can be discussed and agreed to on the spot.

This capability will greatly improve Halliburton's current expensive and time-consuming arrangement of either sending engineers to the site, inviting customers to one of its offices to review plans or mailing the plans to customers and waiting for revisions.

"If we can use videoconferencing to facilitate [the same type of exchange] quicker and easier, then Halliburton is ahead of the game," Woods said.

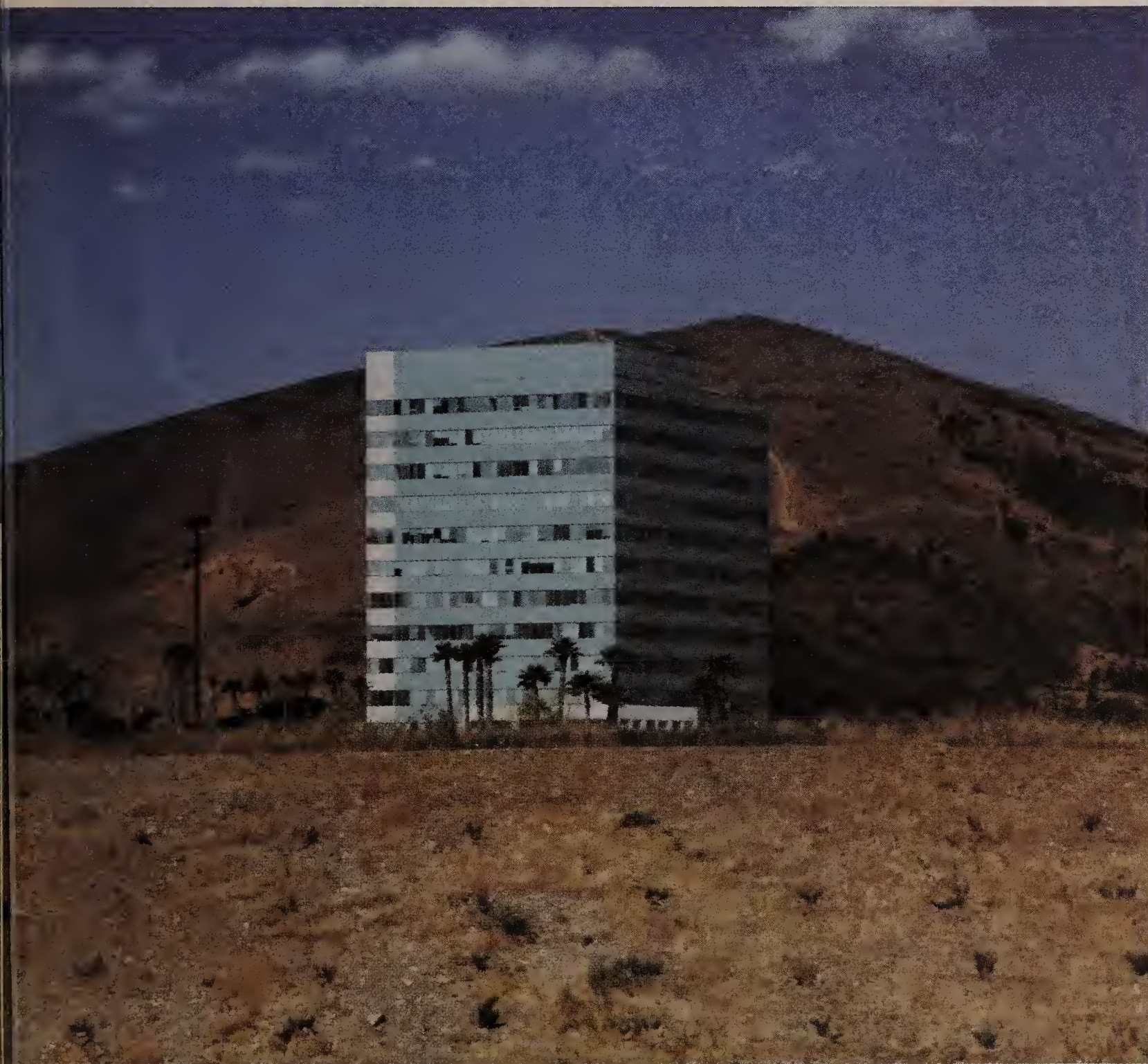
Halliburton will support video links to customer sites using AT&T's Accunet Switched 56 service and videoconferencing between its own sites over an internal T-1 backbone network.

The company is currently studying how it can support videoconferencing units at drilling sites with its very small aperture terminal network. Woods said initial plans call for remote conferencing units to transmit images to its private VSAT hub here, which will forward the video signals to Halliburton's private T-1 network or to AT&T Switched 56 circuits for delivery to the target site.

Woods said Halliburton will pick up the cost for establishing the Switched 56 connections with its larger customers. "You're not talking about a terrible expense — about \$20 an hour for Switched 56 service," he said. "That's not terribly expensive to get direct contact with your customer so you can deliver your services or secure a contract to deliver services."

Each videoconference currently requires 112K bit/sec of bandwidth on the T-1 network or two Switched 56 circuits. PictureTel is expected to ship an upgraded unit later this year that will enable Halliburton and other customers to support videoconferences on a single 56K bit/sec circuit. ☐

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AT&T to reach out, touch new countries

continued from page 4

the foreign country they wish to access.

AT&T will first attempt to route GSDN calls over undersea fiber-optic cable, but in cases where all capacity is in use, the carrier will route calls via satellite.

AT&T and its international counterparts in the four new countries have not yet filed pricing for GSDN. However, users will be subject to different monthly rates for peak and off-peak calling periods. Users also will pay one rate for the first 30 seconds of a call and a second rate for each additional six seconds.

In a related announcement, Douglas McNulty, AT&T's international marketing product manager, said the carrier is readying a forced on-net routing feature that would route direct-dialed international calls over GSDN.

"With this feature, employees can direct-dial international sites and have the calls routed over GSDN instead of over more expensive IDD facilities," according to McNulty. AT&T would not say when it will begin offering the new feature. ☐

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See The FAXNeT Form on Page 19

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

Wang Laboratories, Inc. recently disclosed in its annual report that it sold its InteCom, Inc. subsidiary to the Matra Communications unit of Matra S.A. of Paris for \$26 million. Wang bought InteCom, a Richardson, Texas, switch maker, in stages between 1984 and 1986 for \$89 million in cash and \$140 million in Wang stock.

People & Positions

Parallan Computer, Inc. last week said it has named **William Patton Jr.** chairman and chief executive officer, replacing chairman and cofounder **Charlie Bass**, who stepped down to pursue outside business interests.

Patton, formerly president and CEO of MAI Basic Four, Inc., joins Parallan at a time when the Mountain View, Calif., start-up is preparing to roll out this month its Server 290, an OS/2-based server for local-area network applications. Bass, who also cofounded Ungermann-Bass, Inc., will remain with Parallan as chairman of the executive committee for the company's board of directors.

Teleport Communications Group, a New York alternative private-line carrier, has named **Thomas Byrnes** to the post of vice-president of corporate development. Byrnes, formerly vice-president and group manager of Merrill Lynch Communications, will work to expand Teleport's customer base as well as add new network services.

Teleport expects to soon conclude an interconnection agreement with New York Telephone Co. for collocation of Teleport equipment at a New York Telephone central office. ■

Consumer groups, carriers at odds over call blocking

Disagree over whether to offer it free with caller ID.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — At a recent U.S. House of Representatives hearing on a proposed bill to legalize caller ID services, consumer groups and carriers clashed over a provision that would force service providers to offer call blocking with the offerings.

Consumer groups argued that call blocking is needed to protect individuals' privacy, while carriers testified that mandatory bundling of call blocking with caller identification services could protect obscene callers.

If passed, the bill, called the Telephone Privacy Act, would bestow federal approval on caller ID and automatic number identification (ANI) and would require service providers to offer per-call blocking to callers as well.

This hearing was the first concerning the bill, which was introduced last March by Rep. Robert Kastenmaier (D-Wis.), Rep. Mike Synar (D-Okla.) and Rep. Don Edwards (D-Calif.). It is a companion bill to one introduced in the Senate by Sen. Herbert Kohl (D-Wis.) in January.

Sources said there is little

chance the bill will pass a House vote before Congress adjourns in mid-October. However, Kastenmaier said he plans to push the legislation forward in early 1991.

Kastenmaier, chairman of the House Subcommittee on Courts, Intellectual Property and the Administration of Justice, pointed out the need to enact legislation concerning caller ID and ANI. Technically, both services act as trap-and-trace devices and, thus, pose violations of the Electronic Communications Privacy Act, according to a study conducted by the American Law Division of the Library of Congress.

Call blocking urged

Stephen Moore, public counsel for the state of Illinois who testified for Illinois and the National Association of State Utility Consumer Advocates, said caller ID should be allowed only if free per-call blocking is required.

Moore cited the results of a recent Harris Poll that showed 75% of the American public believe that caller ID should be prohibited or allowed only with blocking.

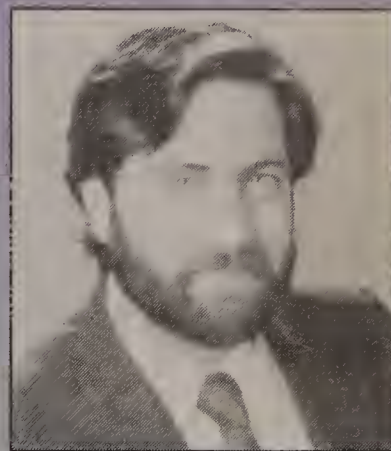
But Bell Atlantic Corp. argued that the blocking requirement

(continued on page 12)



"It was difficult to get the four of us wrapped around one implementation standard; I think if we included anybody else, it simply wouldn't have happened."

Bill Stensrud (left)
Vice-president of marketing, StrataCom, Inc.



"It's a real positive thing that vendors get together to drive the [frame relay] standard. We want to make sure everybody has input because that's what a standard is all about."

Gary Krall (right)
Director of marketing, Advanced Computer Communications

Firms question goals of frame relay group

Overlooked vendors weigh support for strategy; some are suspicious group got jump on market.

By Paul Desmond
Senior Editor

In the wake of the announcement last month of a frame relay specification developed by four vendors, other internetworking suppliers are scrambling to decide whether to support the plan.

The four architects of the specification — Cisco Systems, Inc., Digital Equipment Corp., Northern Telecom, Inc. and StrataCom, Inc. — said the scheme will give the industry a single frame relay implementation on which to base product development.

But other vendors said they think the four companies are using the specification to get a jump on the rest of the market.

In addition, some vendors are striking their own frame relay agreements, raising the specter that incompatible frame relay specifications could proliferate. Vendors, however, admit that such a scenario would not benefit users or suppliers since it would defeat the purpose of a standard.

Instead, some companies are calling on the specification's architects to expand their group to bring in users and other vendors, including carriers that are expected to offer frame relay-based services. Some firms are also calling for a means of interoperability testing, an issue they said has yet to be addressed.

The group that developed the frame relay specification has put it in the public domain, invited other vendors to support it and pledged to update it as frame re-

lay standards firm up ("Firms join to speed frame relay rollout," NW, Sept. 10).

Vendors including Advanced Computer Communications (ACC), Hughes Network Systems, Inc. and Netrix Corp. — all of which are actively working on frame relay products — said they would have welcomed the opportunity to join the group but were either not invited or were denied participation.

Other vendors noticeably absent from the group include

Some companies are calling on the specification's architects to expand their group.

▲▲▲

CrossComm Corp., Vitalink Communications Corp. and Sprint Data Group, all of which had previously announced support for StrataCom's frame relay interface. Vitalink also has an ongoing marketing relationship with DEC.

Larry Mauceri, senior director for product planning at Hughes Network Systems, said he believes that the four vendors kept the group small so they could gain a competitive advantage by being the first to market with frame relay-compatible prod-

(continued on page 12)

INDUSTRY BRIEFS

Cabletron reports gains. Cabletron Systems, Inc. last week reported record sales and earnings for its second fiscal quarter ended Aug. 31, saying the gains were largely due to demand for the company's intelligent wiring hubs and 10BaseT products for running Ethernet over unshielded twisted-pair wiring. Revenue jumped 68%, from \$25.3 million in the corresponding quarter last year to \$42.4 million this year. The company posted earnings of \$13.3 million, a 46% increase over the \$9.1 million reported in last year's corresponding quarter.

Money in the bank. Alantec, a start-up internetworking equipment supplier, last week said it completed a second round of venture capital funding in which it raised \$1 million. To date, the company has raised \$7 million. The money will be used to continue product development and expand product shipments. Alantec is building a 40M bit/sec multiport Ethernet bridge.

Behind schedule. Western Union Corp. last week said the company's planned sale of its EasyLink electronic mail business to AT&T was not expected to be completed by the Sept. 30 target date, but a spokesman said both companies are still optimistic about closing the deal this fall ("AT&T leapfrogs foes with EasyLink deal," NW, July 9). AT&T has an option to walk away from the deal if it is not closed by Oct. 31, the Western Union spokesman said.

Western Union, which has been losing money largely because of sharply decreasing revenue from its Telex business, expects to stave off Chapter 11 bankruptcy proceedings, the spokesman said. If Western Union is forced to file for Chapter 11, the sale of Easylink to AT&T would be terminated, he said. ■



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Firms question goals of frame relay group

continued from page 9

ucts. But Mauceri added that he agreed with the general idea of the group, which is to promote compatible frame relay products.

Gary Krall, director of marketing at ACC, was also cautiously optimistic.

"It's a real positive thing for the industry that vendors get together to help drive the [frame relay] standard forward," said Krall, whose company is working on a frame relay interface for its bridge/router products. "But we're looking at it with guarded optimism. We want to make sure that everybody has had input into this because that's what a standard is all about."

Krall said he would like to see the four vendors broaden the scope of their group to include users and other vendors, especially carriers who will eventually offer frame relay services.

Bill Stensrud, vice-president of marketing at StrataCom, said the four vendors were chosen for their varying areas of expertise: DEC for its computer systems experience, cisco Systems for its local-area network products, Northern Telecom for its public switching perspective and StrataCom for its nodal processor viewpoint.

He said the group was kept small in order to complete the specification faster. "Frankly, it was almost awesomely difficult to get the four of us wrapped around one implementation standard, and I think if we included anybody else, it simply

wouldn't have happened," Stensrud said.

Meanwhile, other companies are at work on their own frame relay agreements and technology sharing arrangements.

Netrix Corp., for example, has agreed to conduct interoperability testing of a standard-compliant frame relay interface between its #1-ISS circuit/packet switch and ACC's bridge/routers, said Thomas Jones, vice-president of marketing at Netrix. In addition, BT Tynnet, Inc. is reportedly working on its frame relay development effort with Netrix and ACC.

Therefore, there is the possibility that another vendor group could emerge with its own frame relay specification. All of the vendors agree, however, that such a move would not further the cause of frame relay interoperability.

"I'd like to see one group that represents the whole community, including users and standards bodies, rather than just vendors taking a totally commercial view," said Robert Streeter, British Telecom, Inc.'s T-NET internetworking product group manager.

Some vendors are also concerned about how to ensure product compatibility.

Krall said the frame relay specification announced last month is "a bit lacking in terms of how these companies are going to qualify their equipment as being interoperable with one another. I think that's going to be a key consideration certainly from the user's point of view as well as from the public service providers'."

Scott Schauer, manager of data services at Northern Telecom, said the group would welcome new members and expects to get them. He said that although the group has no concrete plan to include users, it would entertain the idea.

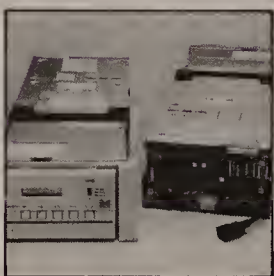
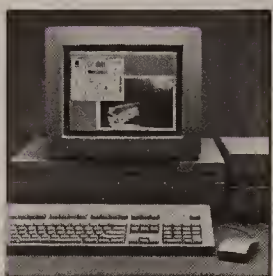
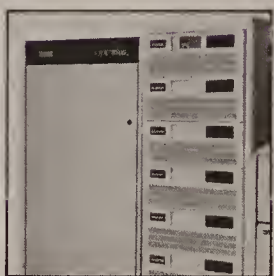
According to Gail Smith, a principal product manager at Codex Corp. who until recently was chairwoman of the ANSI T1S1.1 committee, which is defining the frame relay service description, ANSI is the forum users and vendors should use to air concerns over the frame relay standard.

The standard is currently in draft format and is in the process of final balloting, whereby interested parties can comment on it, she said.

At the same time, she said, Codex supports the early implementation of the standard as proposed by the four vendors, though she stressed that Codex is committed to supporting the final version of the standard when it is approved. Codex resells StrataCom's IPX T-1 multiplexer, which is scheduled to support frame relay.

Stensrud said the standard alone does not guarantee interoperability since it is subject to many different implementations. His group was trying to agree on a single implementation that would enable interoperability. ■

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Consumer groups, carriers at odds

continued from page 9

would drastically reduce the benefits of caller ID. James Cullen, president of New Jersey Bell Telephone Co., said the experience at Bell Atlantic showed that caller ID could deter harassing phone calls. In his testimony, Cullen cited several cases in which the victim identified the harassing caller's number through caller ID and made a return call to the person, which brought an end to the calls.

Cullen emphasized that a mandatory call-blocking mechanism would allow obscene phone callers to cloak their identity.

Moore argued that per-call blocking will not encourage harassing phone calls, adding that other services exist to help victims.

Caller ID is but one of several new Custom Local Area Signaling Services (CLASS) functions designed to assist consumers, Moore said. Other CLASS services such as call blocking, priority call, return call and call trace — which is activated by dialing a three-digit code after receiving a harassing call — are more effective in dealing with obscene phone calls, he said.

"Despite their professed desire to protect customers, telephone companies have either refused to offer these other CLASS services or have made them unattractive by pricing them unreasonably and by reducing their functions," Moore testified. ■

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

The industries using ISDN most in US West, Inc.'s territory are, in order: health care, financial services, education, and state and local governments, according to the Englewood, Colo., carrier.

Carrier Watch

Pacific Bell last week introduced a personal computer program, the Pacific Bell Custom Billing Disk, that will enable users to sort, analyze and extract data from their telephone bills.

Users will receive each month a data diskette containing a maximum of 1,200 pages of call details and monthly charges, and the latest version of the Custom Billing Disk, the analysis software.

The data on the billing diskette includes information about services used — including 800, Centrex and WATS — which was not previously available on paper bills, according to a Pacific Bell spokeswoman.

The billing analysis software enables users to produce reports that compare telecommunications expenses on a monthly basis. In addition, the reports illustrate expenses with bar graphs and pie charts and produce expense reports for departments as well as individuals. They also create chargebacks.

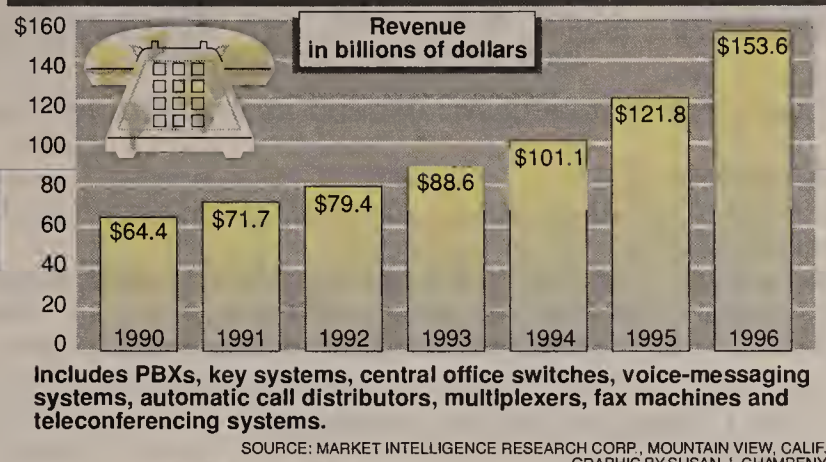
Reports can be sorted by the length or the dollar amount of the call, the date, or the area code or prefix of the number called.

Pacific Bell and PereLine Data Systems, Inc., a software vendor in San Jose, Calif., developed the program.

Pacific Bell is awaiting California Public Utilities Commission approval for the package, which it intends to begin offering in mid-December.

Pacific Bell is planning to charge users \$15 a disk per month and a onetime setup fee of \$100. ■

Global telecommunications equipment market expected to swell



Weighing the differences of voice mail service offerings

Tips on criteria to consider in service evaluation.

Second in a two-part series.

By Maralyn Rosenblatt
Special to Network World

After determining if and how voice mail services might fit into your company's existing telecommunications equipment and services puzzle, the next job is evaluating the actual services. The steps involved in this process are similar to those used when comparing private branch exchanges with Centrex services.

Exploring available options is the first step, building on the basic information gained in the initial planning process discussed in the first part of this article.

Examining the options involves a more extensive, thorough investigation. Face-to-face meetings with specific local exchange carrier or regional Bell holding company personnel should be conducted, and detailed analyses of service offerings should be performed.

Step 2 concerns defining your company's specific requirements. It entails identifying departments that might gain the most benefits from these services, outlining the departments' potential applications, and determining the current and projected number of users.

This step is critical since the effective use of voice-messaging technology, like all information technologies, depends on how well the specific application is designed. The consequences of an inappropriate design are often unhappy end users who may ultimately reject voice messaging.

Developing evaluation criteria is the third step in the process.

Rosenblatt is a senior telecommunications systems specialist with Lockheed Corp. in Calabasas, Calif.

These criteria serve as a basic checklist, which makes it easy to equitably evaluate all offerings since it fosters an apples-to-apples comparison. It also ensures that each of the proposed offerings satisfies all of your company's requirements.

These basic evaluation criteria should address the following six areas: configuration requirements, access capabilities, features, associated costs, contractual issues and vendor considerations. The checklist can also be modified to reflect your company's embedded base, view of technology and the other planning-related concerns that were previously noted.

The consequences of an inappropriate design are often unhappy users.



The configuration section of the checklist indicates your company's number of initial users and the projected number of long-term users. It also specifies the types of applications required, such as call answering or voice messaging.

Any embedded equipment concerns should also be listed, such as the ability to integrate with a specific manufacturer's PBX. The checklist must also specify your company's requirements for subscriber access, such as via 800 service or dedicated circuits, and for telephone system/service connectivity, such as

(continued on page 14)

Passive bus extends limits of ISDN lines

Lets up to eight devices share a single BRI line, providing savings but risking user annoyance.

By Bob Wallace
Senior Editor

An increasingly popular Integrated Services Digital Network feature that enables users to connect as many as eight devices to a single Basic Rate Interface (BRI) line promises to cut ISDN line costs and spur use of the integrated voice/data technology.

The feature, called passive bus, enables as many as eight BRI devices to be strung together in a bus topology to share a single Network Termination 1 (NT1) net interface. Contention for the 2B+D capacity of the BRI link terminated by the NT1 is handled on the D signaling channel.

Customers can use passive bus to support a mixture of phones and data devices, although carriers and early users warn that bothersome contention problems arise when three or more telephones are connected to a single BRI line.

Passive bus has been tarified by Illinois Bell Telephone Co. and is offered on a customer-specific basis by The Chesapeake and Potomac Telephone Co. of Maryland.

"Passive bus offers users a way to cut costs while more efficiently using ISDN lines," said Ian Angus, president of Angus TeleManagement Group, Inc., a Pickering, Ontario, consultancy.

With BRI, a single telephone link supports two 64K bit/sec B channels for voice and data communications, and one 16K bit/sec D channel for signaling information and packetized data.

Adding passive bus enables users to share the B channels for circuit- and packet-switched services and the D channel for additional packet services.

James Devine, director of product development for Ameritech Services, Inc., said Illinois Bell established specific restrictions when it tarified the passive bus capability in July. "By limiting passive bus to support two phones and six data devices, we guarantee each user there will be no contention for a voice path."

Ed Thyberg, network systems manager for Johns Hopkins Health System in Baltimore, initially allowed a maximum of six phones to contend for the two B

(continued on page 14)

WASHINGTON UPDATE

BY ELLEN MESSMER

Tariff 12 filings now total 70. AT&T filed three new Tariff 12 options last week, bringing the total filed to date to 70. None of the three customers were identified. Option 68, which is for voice and data services provided over a three-year period, is valued at an estimated \$48.37 million. Option 69 is valued at \$8.19 million over three years, while Option 70 is worth an estimated \$33.84 million over three years, with a two-year extension option that would bring the total to \$56.63 million.

Distance-sensitive rates not unlawful. The Federal Communications Commission has decided carriers may charge distance-sensitive rates to the first T-3 customer on a three- or 12-line T-3 route and distance-insensitive rates to all subsequent customers using the route. In making the decision, the FCC sided with reasoning submitted by the GTE Telephone Operating Companies that said most of the costs associated with a multiline T-3 system are incurred during installation and, therefore, different rates for subsequent installation are not unlawful. But Commissioner Ervin Duggan dissented from the decision, saying that the idea of recovering costs from the initial customer is unreasonable and discriminatory. He said he agreed with AT&T's view that the FCC decision would create a rate structure that encourages "a free ride at the initial customer's expense."

The FCC decision on T-3 pricing marked the conclusion of its three-part investigation into T-3 pricing. ■

Weighing voice mail service offerings

continued from page 13

Centrex to the central office or PBX trunk connections to the central office.

In addition, required and optional feature capabilities must be specified. This section of the checklist should also include provisions for handling message-waiting indication and call forwarding requirements — for instance, call handling for ring-no-answer or busy-no-answer conditions.

To identify all of the costs associated with these services, the checklist must provide the pertinent onetime and monthly recurring charges.

Contractual issues relate to the pro-

posed term of the voice-messaging service agreement and the commitment for the actual number of users.

The checklist's final evaluation criterion relates to the "vendor picture." It concerns determining each vendor's track record in providing responsive service, its voice-messaging support and technical staff, and its short- and long-term plans for the service.

The fourth step in the evaluation process entails soliciting and evaluating vendor proposals.

At this point, a request for proposal document is created and distributed to a number of key vendors. When the completed vendor proposals are received, they are reviewed and rated using the evaluation criteria specified in the checklist.

A thorough cost analysis is also performed to compare each service's basic

Identifying hidden costs is crucial; failure to do so increases the risk that the project will exceed its budget.

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pricing structure, identify hidden costs and isolate tiered pricing alternatives.

Examples of hidden costs include mail-

box charges for such features as operator revert, per-minute usage charges and Centrex line charges for features such as stutter dial tone. Identifying as many hidden costs as possible is crucial; failure to do so increases the risk that the project will exceed its budget.

The final step concerns developing a detailed implementation plan, which should include project team responsibilities, project milestones and provisions for adequate user training. Such a plan ensures that the transition to the new voice-messaging service will be as smooth as possible.

Mixing and matching

While some users are adamantly disinterested in carrier-provided voice-messaging services, they tend to be from large U.S. or multinational organizations that want the ability to manage and administer their systems — to control their own destinies.

Voice-messaging services are more appealing to smaller organizations because of the ability to trial the service before deploying it, the small amount of capital outlay needed to purchase systems and the interest in having a third party manage and maintain the system.

But even major corporations usually have a combination of large sites with stand-alone voice-messaging systems and smaller branch offices with local exchange carrier- or service bureau-provided voice messaging.

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Passive bus extends limits of ISDN lines

continued from page 13

channels on his BRI lines. If three employees attempted to place a call simultaneously, two got through while the other heard a recording saying the B channel is already in use, he said. Contention problems forced Thyberg to drop all but two telephones from each BRI line.

Jeffrey Fritz, data communications analyst for West Virginia University in Morgantown, said contention for BRI channels has created only minor problems at the institution.

Although passive bus supports as many as eight devices, Fritz configured each BRI line to support four, with each able to use either B channel for voice or the D channel for data transmission at 2,400 bit/sec.

"Once two of the four grab the B channels, they're spoken for," Fritz said. "The third user receives a message on the set's display that says the circuits are in use."

Fritz has received few complaints regarding contention largely because four employees vying for two BRI circuits is an improvement over 15 users on a single key system contending for one line, which was the case before ISDN.

Fritz said he minimized contention problems by restricting data communications to the D channel and supporting a 2,400 bit/sec top speed per device.

While the university is making do with contention, some analysts warn against having more than two phones share a BRI line.

"It's not a very good move," said Chuck Kanupke, president of Kanupke Associates, Inc., a consultancy in Haddonfield, N.J. "In today's environment, most people won't tolerate contention," he said. □

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

The Publisher's Network received 53,000 electronic book orders from college book stores during July and August, double the amount it received for the corresponding period a year ago. The net, formed by 24 book publishers, wants to triple this year's figure next year.

Data Packets

Digital Communications Associates, Inc. (DCA) last week introduced a scaled-down version of its CrossTalk asynchronous communications software aimed at small businesses and non-technical users.

CrossTalk Communicator runs on DOS-based microcomputers and was designed to be easier to use than DCA's more expensive and feature-rich CrossTalk XVI.

During the software installation process, users key in information to identify which of the microcomputer's serial ports is supporting a modem. They can then load modem operational parameters by selecting their modem from a list of 50 brand-name models. The software automatically sets itself to work with that modem.

CrossTalk Communicator includes files that contain configuration settings needed to log on to such value-added network services as CompuServe, Inc., Dow Jones News/Retrieval and the Official Airline Guide. Users add the service telephone number, their account number and password to the appropriate file. That file can then provide the necessary information for them to log on.

CrossTalk Communicator is available now for \$99.

Telco Systems Network Access Corp. last week introduced (continued on page 18)

IBM, MCI and Merit look to sign new NSFNET users

Will use revenue to fund major net upgrades.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — IBM, MCI Communications Corp. and Merit, Inc. recently formed a non-profit company to market high-speed networking services offered to users on the National Science Foundation Network (NSFNET).

The move will enable Merit, which runs the network for the U.S. government, to use revenue generated by signing commercial users and organizations not funded by NSF grants to subsidize enhancements to the net. Such enhancements include a planned upgrade to support T-3 speeds.

"The demand for networking is skyrocketing," said Allan Weis, president and chief executive officer of the newly formed company, called Advanced Network & Services, Inc. (ANS). Weis, who previously served as vice-president of engineering/scientific computing for the Data Systems Division of IBM Enterprise Systems, said ANS was founded to broaden NSFNET's subscriber base, raise the network's speed and fine-tune service.

Company's mission

Under its charter, ANS will reinvest revenue generated by the addition of new users to the net-

work, with the goal of bringing down network costs for users. As seed money, MCI and IBM are each investing \$5 million over three years. They are also each contributing personnel.

ANS will not meddle with the existing contract that calls for Merit to manage the network until October 1992. However, once

As seed money, MCI and IBM are each investing \$5 million over three years.

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that pact expires, the company hopes to win a contract from the government to run the network.

Merit, a consortium of state-supported Michigan universities, has operated NSFNET under contract to NSF since 1987. MCI and IBM are Merit's main subcontractors.

Under subcontract to Merit, IBM has supplied the hardware and software for the NSFNET backbone switching and routing (continued on page 20)

Fast packet expected to grow rapidly

By Jim Brown
Senior Editor

PARSIPPANY, N.J. — Frame relay and vendor-proprietary fast packet switching technologies will fuel growth in the packet-switching market, according to a recent report published by Eastern Research Corp. here.

The report, "Packet Switching: Markets, Strategies and Forecasts for the Next Five Years," stated that the new technologies will improve service performance levels and enable users to support advanced applications over X.25 networks.

Packet-switching vendors and carriers will begin to implement the emerging international frame relay standard, as well as proprietary versions of fast packet technology during the next five years, the report stated.

By decreasing packet protocol processing overhead, the standard and some proprietary technologies will likely support significantly faster response time between terminals, microcomputers and remote hosts, said Robert Rosenberg, director of analytical services at Eastern Research, an affiliate of Eastern Management Group.

This response time improvement will make packet switching

The response time improvement will make packet switching more attractive to users.

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more attractive to users that want to support on-line transaction processing (OLTP) applications.

Companies such as MasterCard International, Inc. and (continued on page 18)

IBM's plate of OSI products

Functionality	Platforms				
	MVS	VM	OS/400	OS/2	RISC System/6000
Connectivity					
WAN X.25	Available	Available	Sept. '91	March '91	Dec. '90
ISDN	Nov. '90	Dec. '90	Reviewing	Reviewing	Reviewing
802.3 CSMA/CD	Nov. '90	Dec. '90	Future	March '91	Dec. '90
802.4 (Token bus)	Future	Available	Reviewing	Available	Reviewing
802.5 (Token-Ring)	Future	Future	Future	March '91	Dec. '90
FDDI	Future	Future	Reviewing	Reviewing	Reviewing
Layers 3 to 7					
CLNS/CONS	Available	Available	Sept. '91	March '91	Dec. '90
Transport/Session/Presentation	Available	Available	Sept. '91	March '91	Dec. '90
ACSE	Available	Available	Sept. '91	March '91	Dec. '90
Remote Program Interface	Available	Available	Reviewing	Future	Reviewing
APIs	Available	Available	Sept. '91	March '91	Dec. '90
CMIP/CMIS (net management)	Available	Available	Sept. '91	March '91	Future
X.500 Central Directory	Available	Available	Sept. '91	March '91	Reviewing
Application Layer 7					
X.400 MHS	March '91	Dec. '90	Future	Future	Dec. '90
FTAM	Available	Available	Nov. '91	June '91	Dec. '90
MMS	Reviewing	Available	Reviewing	Available	Future
C/COBOL API	Available	Available	Nov. '91	March '91	Reviewing
ACSE = Association Control Service Elements API = Application Program Interfaces CLNS/CONS = Connectionless network service/connection-oriented network service CMIP/CMIS = Common Management Information Protocol/Common Management Information Services DAE = Distributed automation edition FTAM = File Transfer, Access and Management MHS = Message Handling System MMS = Manufacturing Messaging Service					

The above represents most of the OSI products and services IBM offers or plans to offer, including four connectivity options (highlighted) supported by the IBM 3172 Interconnect Controller.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: IBM, RYE BROOK, N.Y.

IBM's OSI strategy handcuffs net users

Despite major OSI product rollout, few options exist to route OSI traffic over SNA backbones.

By Paul Desmond
Senior Editor

NEW YORK — IBM's recent Open Systems Interconnection announcements plugged some gaps in the vendor's product suite, but analysts said a missing link remains because users cannot route OSI data over existing SNA backbones.

To take advantage of IBM's OSI/Communications Subsystem, which gives IBM computers access to OSI applications, users must establish parallel wide-area connections separate from lines that support Systems Network Architecture traffic.

Analysts said the IBM approach is a drawback to open systems and could leave the door open for competitors such as NCR Comten — which can simultaneously support SNA, OSI and Transmission Control Protocol/Internet Protocol on its front-end processors — to steal some business from IBM.

IBM, however, is working to address those concerns, initially via the 3172 Interconnect Controller, a device that attaches any

industry-standard local-area network to a mainframe channel (see graphic). IBM has increasingly enhanced the 3172 and is promising it will support both SNA and OSI protocols simultaneously.

Meanwhile, however, "IBM customers who need TCP/IP or OSI connectivity will find themselves building parallel networks to their enterprise SNA network, as opposed to being able to build a single transport network that can handle SNA, TCP/IP and OSI," said David Passmore, a partner at Ernst & Young's Network Strategies, Inc., a consultancy in Fairfax, Va. "You're not going to be able to run any of the products that talk OSI protocols over your bought and paid for SNA enterprise network."

That's because of the way IBM chose to implement OSI.

Its OSI/Communications Subsystem, which supplies the middle layers of the OSI stack and is the base on which users run OSI applications, initially supported only X.25 wide-area links. Last (continued on page 20)

Perhaps its best feat



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NEC

Fast packet expected to grow

continued from page 15

American Airlines, Inc. already use packet switching to support OLTP. MasterCard uses it to support credit card authorization, while American Airlines has deployed a packet-switching backbone to support its reservation network.

The response time improve-

ment attributed to frame relay, coupled with the technology's ability to support higher speed circuits than existing X.25 technology, will also make packet switching a feasible alternative for interconnecting local-area networks, Rosenberg said.

In addition to frame relay and

X.25, the report covers a broad mix of other packet-based products and services such as local-area network adapter boards, facsimile modems and Common Channel Signaling System 7.

The report estimates that the market for packet-switching equipment and services will reach \$7.5 billion by the end of 1990 and explode to \$23.3 billion by 1994.

Equipment sales are projected to grow from \$1.8 billion in 1990 to \$3.5 billion in 1994, while revenues for packet-switching services are expected to rise from \$5.7 billion in 1990 to \$19.8 billion in 1994.

Interest blossoms

User interest in packet switching has been keen since the technology was developed in the

1960s by the Defense Advanced Research Projects Agency (DARPA) as a way to link computers at various research facilities across the country. DARPA's work eventually evolved into the Transmission Control Protocol/Internet Protocol.

Packet-switching technology received another boost in the 1970s when X.25 was developed as a method for linking clusters of terminals to remote hosts over a single circuit.

"There is little doubt that packet switching right now is the preferred means of computer-to-computer communications," Ro-

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Equipment sales are projected to grow from \$1.8 billion in 1990 to \$3.5 billion in 1994.

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senberg said. "Frame relay represents the best short-term migration path upward in terms of performance and reliability."

More improvements

Other standards such as broadband Integrated Services Digital Network — which also supports packet switching — will represent even further improvements in speed and performance when they become available in the next 10 to 15 years, he added.

Frame relay will not totally replace X.25 in the next five years, however. "X.25 has still got some legs left," said Bart Stuck, president of Business Strategies, a consulting firm in Westport, Conn., that assisted in preparing the report. "Frame relay is really only a souped-up X.25." □

Data Packets

continued from page 15

duced a local-area network bridge that supports data compression. The Fastlane product works with any vendor's T-1 multiplexer to increase to 256K bit/sec the effective throughput of a 64K bit/sec DS0 channel between remote LANs. The product can also increase the effective throughput of a 56K bit/sec digital data circuit to 224K bit/sec.

Once attached to a LAN, Fastlane uses an algorithm called Adaptive High-Density Compression to compress incoming data from the LAN. That compressed data is passed over a separate link to either the 56K bit/sec circuit or a port on a T-1 multiplexer, which mixes the compressed data with voice and other data traffic over a T-1 circuit to the remote site.

Fastlane costs \$8,500 and is scheduled to be available next month. □

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IBM's OSI strategy handcuffs net users

continued from page 15

month, IBM announced the subsystem would also support LAN links to OSI-based computers via the 3172 ("IBM widens support for OSI within SAA," *NW*, Sept. 24).

While users previously could support SNA and OSI links via the same X.25 connection to a front-end processor, analysts said the sluggish performance of IBM's Network Control Program (NCP) Packet-Switching Interface (NPSI) makes that an

"NCR Comten is now providing the multivendor integration over the wide-area backbone that IBM will eventually have to provide," Harrison said.

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unattractive choice. Further, a limitation with the 3172 strategy is that it must be channel-attached to the mainframe, allowing it to provide support for locally attached LANs but offering no support for wide-area LAN connections.

Despite IBM's promise to provide SNA and OSI support simultaneously in the 3172 and VTAM, users will not be able to support both protocol suites over wide-area links — at least not with IBM products.

NCR Comten has announced software that lets its 56X5 front-end processors support OSI simultaneously with TCP/IP and SNA across wide-area SNA backbones ("NCR Comten to support OSI on FEPs," *NW*, March 5).

IBM, MCI, Merit look to sign NSFNET users

continued from page 15

system, and MCI has supplied the high-speed backbone spanning almost 25,000 miles.

Douglas Van Houweling, vice-president for information technology at the University of Michigan and a member of the ANS Board of Directors, said, "We needed a new structure just to continue."

NSFNET now links more than a thousand university sites, industrial research laboratories and government research centers domestically and internationally. By connecting to the NSFNET backbone net, hundreds of thousands of researchers can access supercomputing centers, library collections, medical imaging services, video applications and data bases.

By year end, Merit, IBM and MCI will add three network nodes, for a total of 16. Perhaps more importantly, they will boost the network's backbone speed from T-1 to T-3 in order to handle more advanced applications and provide extra bandwidth to accommodate the anticipated growth in the customer base.

"There is much more demand for this type of network than the National Science Foundation is funded to provide," said John Armstrong, IBM vice-president for science and technology and a member of the ANS board. "We view this company as a

"NCR Comten is now providing the multivendor integration over the wide-area backbone that IBM will eventually have to provide," said Jim Harrison, senior research analyst at the META Group, a consultancy in Westport, Conn.

Network Strategies' Passmore agreed. "[NCR] Comten's in a nice position of having a product that will simultaneously route SNA, TCP/IP and OSI traffic. I don't know of anybody else who can do that," he said.

However, analysts expect IBM to address the need to support multiple protocols on existing backbones, possibly via the 3172.

Clearly, the device is taking on an increasingly important role in SNA nets. On Sept. 5, IBM announced that the 3172 would be the vehicle used to connect 100M bit/sec Fiber Distributed Data Interface nets to SNA hosts. It also announced that, with complementary enhancements to VTAM, the 3172 would simultaneously support SNA and OSI traffic. IBM added that the 3172 would support a maximum of four T-1 links in order to tie two VTAMs to each other.

Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C., said he expects the 3172 to be further enhanced to become a router-type node. Since it already supports a T-1 interface for the VTAM-to-VTAM feature, IBM would only have to take it a step further and put a LAN and T-1 interface in the same box, instead of a T-1 and a channel interface as it stands today.

The company could then turn the 3172 into a wide-area routing node capable of directing traffic among dispersed LANs and granting access to host-based services such as the OSI/Communications Subsystem as necessary.

"Then the network could handle SNA, OSI and TCP/IP all within the same box for [about] \$15,000," Dzubeck said. "I think the 3172 is the building block of the future that IBM is banking on." ■

first step in the high-performance computing initiative proposed both by the [Bush] administration and Congress."

"This is a small piece within the supercomputing initiative," said Weis, adding

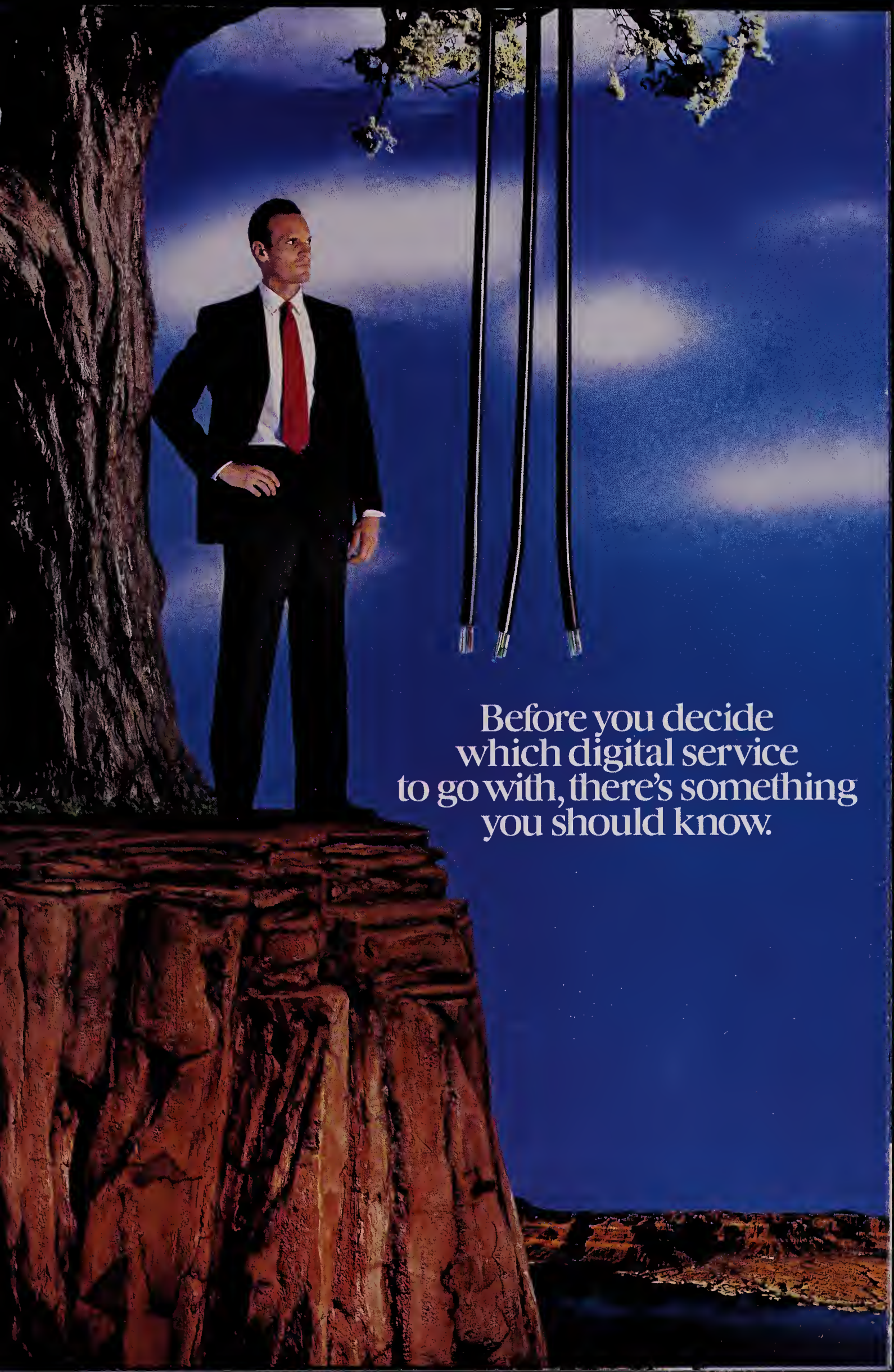
"This is a small piece within the supercomputing initiative," said Weis, adding that "it is one of the first times industry has stood up with its own money."

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that "it is one of the first times industry has stood up with its own money."

According to Sen. Al Gore (D-Tenn.), who says he would like to see a research network in place running at gigabit speeds, the creation of ANS shows that "the business community recognizes the need for a high-speed computer network."

But, as Gore said, "that recognition alone isn't enough to build the national network we need. The federal government is an essential catalyst for developing and demonstrating this technology." ■



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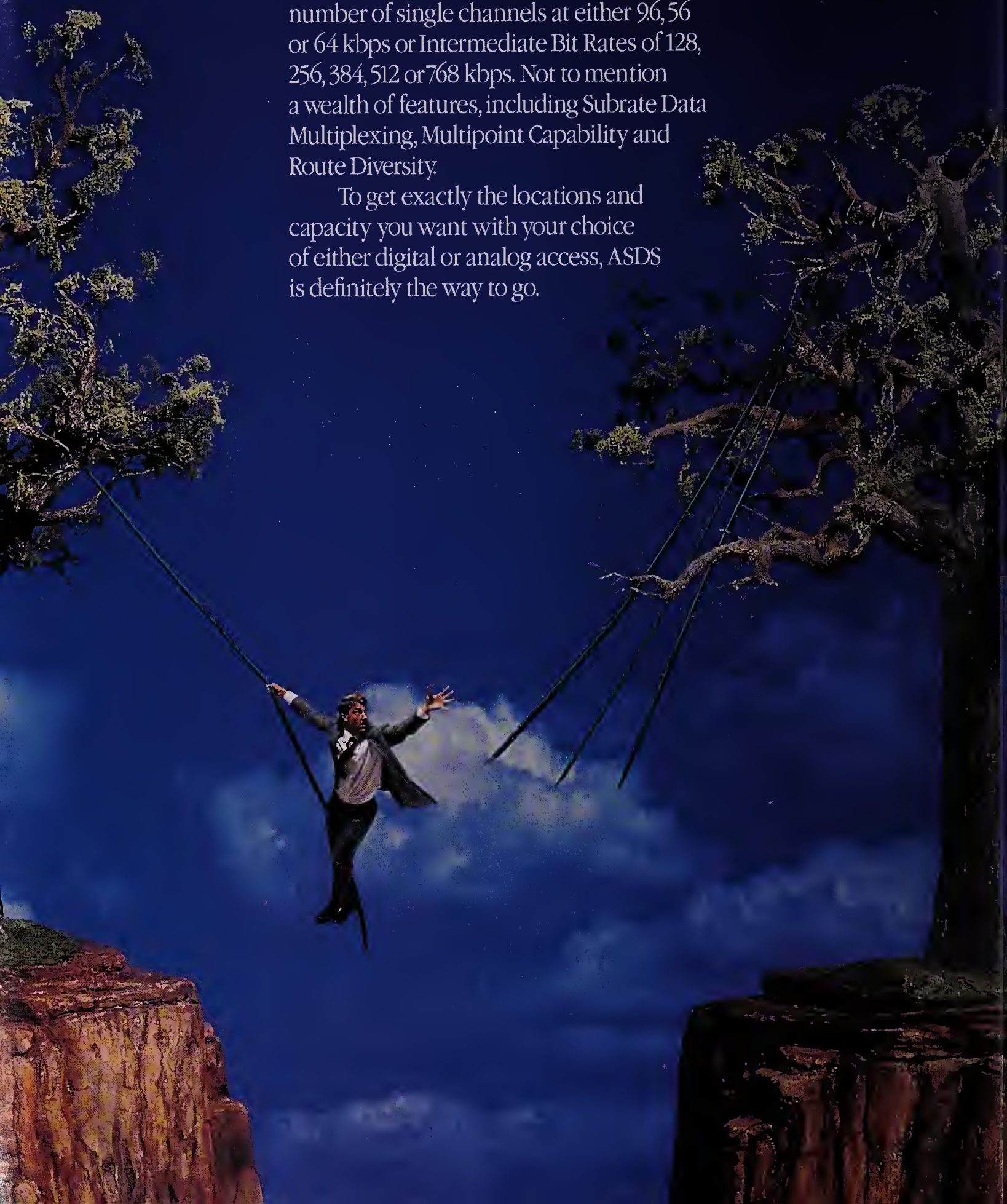
A man in a dark suit and white shirt is swinging on a rope over a deep chasm. A large, white, mesh-like safety net is stretched across the bottom of the chasm, supported by two large tree stumps. The background is a deep blue sky with some clouds. The overall scene is a metaphor for network reliability and safety.

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Bill Krause
Chairman
3Com Corp.
Santa Clara, Calif.

Cisco Systems addresses low end with new router

Details plans to support frame relay in products.

By Tom Smith
New Products Editor

MENLO PARK, Calif. — Cisco Systems, Inc. last week rounded out its family of routers with the introduction of a new low-end model and said it will announce frame relay support for its routers later this month.

The company's new Integrated Gateway Server (IGS) router is designed to link a single local-area network to a remote office or two local Ethernets. By integrating all of the functions of its existing routers on a single board, Cisco Systems was able to make the router's cost comparable to that of a LAN bridge, the company said.

Cisco Systems' new IGS sup-

port to communicate with remote Ethernets and 4M bit/sec token rings supported by the larger devices.

In addition, the IGS can be used to link Ethernet users to an X.25 packet-switched backbone.

Unlike Cisco Systems' larger routers, the IGS is based on a single board that contains the hardware of three boards in Cisco Systems' other routers. As a result, the company is able to offer IGS for \$4,995 in a local configuration and \$5,495 in a remote setup. Bridging software costs \$450.

IGS is expected to be available on Nov. 1.

Cisco Systems said it expects to announce software at the INTEROP 90 Conference and Exhibition to be held Oct. 8 to 12 in San Jose, Calif., that will enable its routers to support frame relay.

The software will support the frame relay specification developed by the company in conjunction with Digital Equipment Corp., Northern Telecom, Inc. and StrataCom, Inc. ("Firms join to speed frame relay rollout," NW, Sept. 10). That specification is designed to enable vendors to develop compatible frame relay offerings before the frame relay standard is finalized.

Frame relay is an emerging Integrated Services Digital Network standard for packet switching at speeds up to T-1 that is particularly suited for applications such as linking remote LANs. It is a streamlined version of X.25 that reduces protocol processing overhead inherent in the CCITT standard and supports dynamic bandwidth allocation.

In addition to frame relay support, Cisco Systems said the new software will enable its products to function as gateways between DECnet Phase IV and Phase V nodes, converting between the two protocols.

Finally, Cisco Systems said the latest release of its software will support priority queuing, which enables users to assign priorities to certain protocols, such as DEC LAT, or particular applications, such as file transfer or electronic mail.

This feature will allow users to give priority to such protocols or applications during times of heavy router usage. The software will support four queues, with the data from the queues transmitted in the order specified by the user.

Users with a software maintenance contract can upgrade to the latest release free of charge. The new software is also expected to be available on Nov. 1. ■



DEC's manufacturing facility in Augusta, Maine.

DEC relies on LANs in plant automation

Firm achieves sevenfold productivity increase by putting its offerings to work in manufacturing.

By Laura DiDio
Senior Editor

AUGUSTA, Maine — A Digital Equipment Corp. manufacturing facility here has come to rely on the very networking products it makes to achieve a sevenfold increase in productivity and reduce product assembly time by two-thirds.

The plant, which makes 90% of all DEC network products shipped in the U.S., uses its local-area and wide-area networks to control inventory, monitor workflow, order materials and access product design information and manufacturing schedules at DEC facilities worldwide.

DEC also uses the plant as a model for customers interested in emulating the network techniques to make their own businesses more efficient and cost-effective, according to Plant Manager Robert Jackson.

The approximately 200 customers who visit the Augusta plant come to see how the company has integrated 12 Ethernet subnets with an Ethernet backbone supporting multiple protocols, including DECnet, the Local Area Transport (LAT) protocol and the Local Area VAXcluster (LAVC) protocols, said Bill Morgan, the plant's network and telecommunications manager.

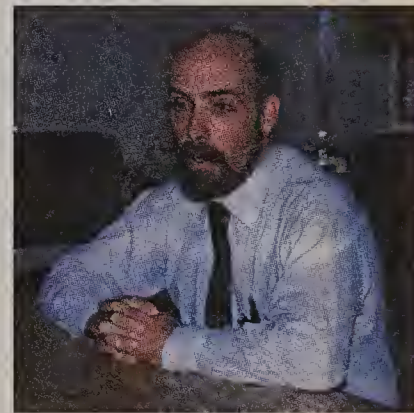
"All of our networking products are compatible across Ethernet so we can run LAT, DECnet and LAVC on the same physical wire," Morgan said. "To the users, it appears as one virtual net."

In addition, the 700 employees at the plant can use the LANs to access DEC's EasyNet WAN to communicate with DEC employees worldwide. The Augusta facility is linked to EasyNet via DEC-

router 2000s, which transmit data over 56K bit/sec dedicated lines to DEC facilities in Burlington, Vt., Littleton, Mass., and Salem, N.H., Morgan said.

DEC first began phasing in Ethernets at the 311,000-sq.-ft. plant six years ago. Now, nearly all of the plant employees have access to the LAN as well as EasyNet.

It wasn't always that way, recalls Kim Williams, customer in-



Bill Morgan

tegration and applications solutions business manager at the facility.

Eleven years ago, the Augusta site had one terminal, which was used by plant supervisors to access the status of parts inventory levels. Now, virtually all of the employees access the network during a typical workday and about two-thirds of the executives and engineers have terminals at home and dial-up access to the network.

The network supports a total of 250 DEC personal computers and VT-240 terminals. The networks support general-purpose applications such as file and print sharing, accounting, electronic mail and VAXnotes, which is the

(continued on page 22)

Netnotes

Racal InterLan recently introduced a gateway that links Novell, Inc. NetWare and Transmission Control Protocol/Internet Protocol local-area networks.

The TCP Server for NetWare is a stand-alone hardware and software device that comprises Racal's NP600/XL intelligent Ethernet controller and TCP Server software. The NetWare interface is provided via any Novell-supported network interface card, said Robert Nerz, Racal InterLan's software product line director.

TCP Server for NetWare enables MS-DOS and OS/2 workstation users on NetWare Version 2.1X and NetWare 386 LANs to access files on any TCP/IP-based host or server. It also allows users on TCP/IP nets to access NetWare servers and LANs. Users on both NetWare and TCP/IP-based LANs can share file and print services as well as electronic mail.

Nerz said the gateway also supports a variety of client workstation applications including Telnet and File Transfer Protocol.

The TCP Server for NetWare gateway is priced at \$5,995 and is expected to ship in 30 days.

For more information, contact Racal InterLan at 155 Swanson Road, Boxborough, Mass. 01719, or call (508) 263-9929. ■

The IGS can be used to link Ethernet users to an X.25 packet switched backbone.

▲▲▲

ports the same functions as the existing products in the company's family of routers, which include the CGS, MGS and AGS. The units can route protocols including Novell, Inc.'s Internetwork Packet Exchange (IPX), Apple Computer, Inc.'s AppleTalk, as well as Transmission Control Protocol/Internet Protocol and X.25. They can also be configured to function as protocol-independent bridges.

When used as a local router, the IGS supports two Ethernet links. When configured to work remotely, it supports a single Ethernet and a single wide-area connection at speeds up to 7M bit/sec.

The CGS, MGS and AGS, by contrast, support four, 12 and 32 ports, respectively, for any combination of local and remote connections.

Used as a local router, the device can link Ethernet segments to an Ethernet backbone or isolate, for performance purposes, portions of an Ethernet that generate heavy traffic.

When used in wide-area networks, the IGS can link a single Ethernet to an Ethernet connected to a remote IGS or to one of Cisco Systems' larger routers. In the latter scenario, Ethernet users linked to an IGS could com-

DEC relies on LANs in plant automation

continued from page 21
company bulletin board.

It also supports specialized applications that include Manufacturing Resource Planning (MRP) II, a manufacturing and inventory system, factory data collection, and computer-aided design and manufacturing.

The executives and engineering groups work on about 45 VAXmate and DECstation personal computers attached to MicroVAX IIs configured as file servers. The MicroVAX file servers run DEC's Personal Computer Software Architecture.

The administrative and factory floor workers use VT-240 terminals supported

by DEC DS500 terminal servers running the LAT protocol. The VT-240s are used for E-mail, spreadsheet and manufacturing support applications.

Regardless of whether the workers are using a terminal or a personal computer, they can initiate a session on the VAXcluster to invoke and send mail to terminal or microcomputer users.

The plant uses DEC's Distributed File Service (DFS) software to allow clients to access files on various host machines across the network. This means users don't have to move from system to system to access a host or a file on another host on a different Ethernet segment.

The network advantages fall into two categories: those realized from the local Ethernets and those realized from being

able to access remote data bases and send E-mail messages across EasyNet.

Simplifying the process

Bill McNally, a manufacturing supervisor in the plant, said the dozens of local Ethernets simplify the manufacturing processes and are responsible for the seven-fold increase in plant productivity.

Using VAXcamera, a video image server that was developed by four DEC engineers over EasyNet in a space of three months, assembly workers on the plant floor can log on to the network and call up an enlarged color-coded picture of the particular device they are assembling.

Plant supervisors can add annotations to the photo in the form of written instructions such as how to avoid common mis-

takes or pointing out the exact angle at which a part should be placed.

"This has nearly eliminated the need to rework products," McNally said. "It shows all the exact installation steps on screen. In the past, we'd assemble thousands of parts and go to test them only to find they didn't work because one or two pieces of the product had been put in backwards."

Before the digitized images became available on the network 18 months ago, employees had to rely on cardboard mock-ups of product schematics, which were often outdated or missing altogether.

The local Ethernets are also the reason the Augusta MRP facility has been able to synchronize manufacturing and assembly product run rates, substantially reducing the time it takes to assemble network products.

"Before we had the Ethernets, it took me 15 days to assemble a typical product," McNally said. "I have products going through the line now in three to five days."

The automation effort has also enabled the facility to maintain a constant work flow so DEC doesn't underutilize or over-extend plant capacity. The networks enable plant supervisors to monitor whether they are maintaining the correct run rate and to identify the status of jobs.

By logging on to the LANs, supervisors can determine if job orders are pending and available for assembly and whether the plant has all the materials in stock to build the job.

"This eliminates the need for the plant manager to run around chasing the plant supervisors to check on the status of a job," McNally said. "Before this, I had to sit down every week, look into my crystal ball and say, 'I think I'm going to build XYZ part next week.' I'd guess at how many of a particular component I had in stock; it was only accurate sometimes."

The networks have also enabled DEC to save the cost of printing out a daily 100-page work-in-process report. "We abandoned process reports a year ago," McNally said. "It's no longer necessary because any information we need is right on the system and we can access it in 30 seconds."

EasyNet does it

The wide-area links help DEC work better with suppliers and other DEC locations.

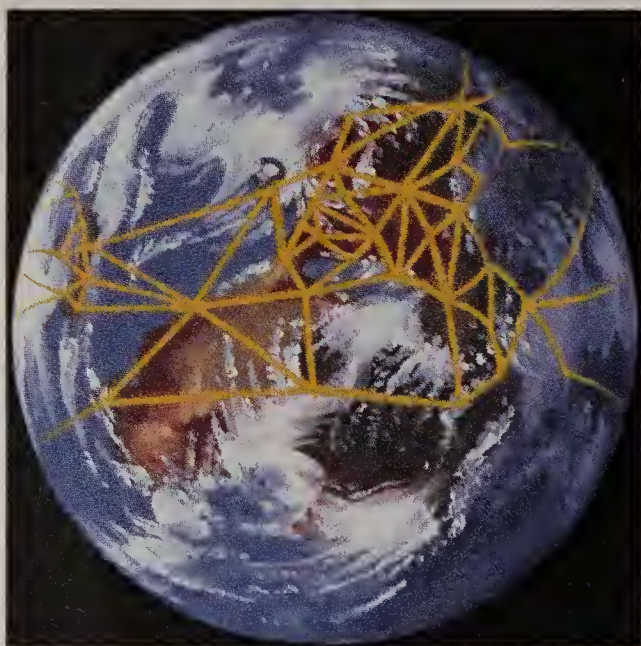
DEC maintains links to suppliers for inventory control and ordering purposes. For example, the company uses the network every day to order the corrugated boxes that will be needed the next day. "Six months ago, we were renting a warehouse down the road where we were storing the boxes; we're saving thousands of dollars each month by not renting warehouse space," McNally said.

The ability for plant users to access product designs using the corporatewide EasyNet gives the corporation a competitive advantage as well, DEC's Williams claimed. Production engineers at the factory can tap into remote design data bases and download the latest designs straight to the factory.

In the last 18 months, DEC introduced new networking products in the U.S. that were designed at DEC engineering facilities in Littleton, Mass., Merrimack, N.H., Australia, England, France and Ireland, Williams said.

"We couldn't have done this without access to the various data bases on EasyNet, which lets us communicate rapidly and accurately," Williams said. ■

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

"The political maneuvering in some network departments makes Massachusetts politics look like child's play."

Patrick Springer
Director of industry services consulting
Computer Task Group
Needham Heights, Mass.

Association Watch

The Communications Managers Association (CMA) announced the editorial advisors for the five tracks of CMA Telecom '90, the group's annual educational seminar and trade show to be held Oct. 21 to 24 at the New York Hilton.

The CMA Telecom '90 conference tracks and their scheduled editorial advisors are: network management, John Gallant, editor of *Network World*; voice processing, Tom Buckle, executive editor of *ProComm* magazine; call center management, Curt Harler, editor of *Communications News*; telecommunications management, Fred Knight, editor of *Business Communications Review*; and technology, Joseph Braue, editor of *Data Communications*.

The five editors will also form the core of the 1991 CMA Conference editorial board.

CMA President Ron Kopitowsky said the track advisors will work with the CMA conference committee to bolster the timeliness, relevance and expertise level of the track sessions.

CMA, which represents more than 225 companies, has been supporting and serving member organizations in a range of telecommunications activities for over 40 years. More than 30 sessions, tutorials and presentations will be made during the course of the four-day CMA Telecom '90 event.

For more information about the conference, contact the user group at (800) 262-3976. ■

Team players

The most effective teams comprise individuals with diverse working styles. Every team should have:

A contributor

A task-oriented person who is good with details and enjoys supplying the team with specific technical data.

A collaborator

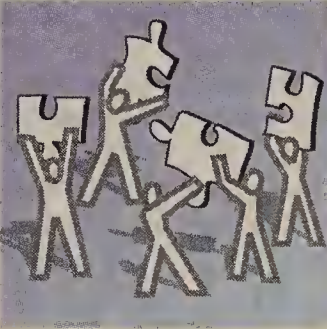
A goal-oriented member who pushes the team to fulfill its mission and is open to new ideas or methods for achievement.

A communicator

A process-oriented individual who is an effective listener and consensus builder.

A challenger

A person who questions the goals, methods and ethics of the team and encourages the group to take well-conceived risks.



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: GLENN PARKER, *TEAMPLAYERS AND TEAMWORK*

Training in team building critical to complex projects

Keeps personal motives from undermining efforts.

By Wayne Eckerson
Senior Writer

The complexity of today's network projects requires managers to enlist professionals with a variety of skills and expertise to work together in cross-functional teams. But building effective teams isn't easy, according to net managers interviewed by *Network World*.

The key to success is to give staff members specialized training in group dynamics and team building, most managers said. Without training, diverse personalities, departmental politics and conflicts over the leadership and direction of the group can undermine the team's effectiveness.

At McDonnell Douglas Aerospace Information Services Co., all employees receive training in team building and group dynamics as part of the company's quality improvement program.

"With proper training, it's amazing how rapidly newly formed groups can gel and begin working together," said Lionel Gillerman, manager of network technology at the Cypress, Calif.-based firm.

Gillerman added that using teams to tackle networking problems gets individuals to "buy into" a project and makes them much more productive. "The strength of the team is that it can be much greater than the sum of its parts," he said.

In his book *Team Players and Teamwork*, Glenn Parker says that effective teams contain four types of players: contributors, collaborators, communicators and challengers (see graphic). Parker claims teams that lack any one of these personality types will experience difficulty and fail to achieve maximum productivity.

While network managers said it's important to consider personalities and group styles when forming teams, they said they often do not have much flexibility and are limited in their choice of individuals by the size and skill sets of their departments.

Like McDonnell Douglas, Xerox Corp. relies on training to circumvent this problem. As part of a course on group interaction skills, members of Xerox's telecommunications department are videotaped while they participate in a meeting. The class discusses the videotape and categorizes the types of behavior exhibited by each group member.

"While the training doesn't

"With proper training, it's amazing how rapidly newly formed groups can gel."



change the way people behave in groups, it makes them more cognizant of their interactive styles," said Fred Bolton, manager of telecommunications services at Xerox in Webster, N.Y. "This helps us speak the same language and enables teams to function more smoothly."

He added that the training frees him to put together teams on the basis of individuals' skills rather than their personalities.

But teams can fail for more than a lack of training, said Patrick Springer, a network and management consultant at Com-

(continued on page 24)

RFP alternatives can help speed decisions

Detailed RFPs fall out of favor as companies look for new ways to shorten the acquisition cycle.

By Maureen Molloy
Staff Writer

The request for proposal is fast becoming an antiquated purchasing tool, according to some users who say they need a faster way of getting vendor solutions to their networking problems.

The inordinate amount of time it takes to write a detailed RFP and the lag time between the issuance of an RFP and the receipt of vendor replies was the predominant complaint most users voiced about the RFP.

"RFPs weren't good in the past, and they're even worse today because business changes so quickly and specifications have a short shelf life," said Cheryl Currid, director of applied information technology at Coca Cola Co. Foods Division in Houston.

Currid says she hasn't written an RFP in three years. "With most RFPs, vendors are bidding on a set of specs that aren't valid anymore."

Matthew Buchman, information systems manager at Betts, Patterson and Mines, P.S., a Seattle law firm, agreed. He said an RFP can run hundreds of pages in length and can easily increase the cost of and add four to six months to an IS project.

As a result, Buchman said, "You've lost the competitive edge and are lagging behind in the race with automation technology."

When he was hired by the firm last year to build a network, Buchman devised what he says is a more efficient method for solving automation needs. Buch-

(continued on page 24)

GUIDELINES

BY BRUCE ELBERT

Users, vendors gain from good working relationship

While vendors often hold the key to network performance, many communications managers fail to understand the importance of establishing a good working relationship with their suppliers. In a successful relationship, both sides achieve their goals. The network manager obtains the desired network capabilities, including the ability to respond to changing requirements; and in satisfying the customer, the vendor achieves its sales and financial goals.

Vendor and user organizations operate the network as one team, sharing a commitment to success. Net managers work closely with their counterparts in the vendor organization, exchanging views and developing strategies to enhance service to end users.

The keys to building a solid vendor relationship are:

- Define your requirements in advance and match them with the vendor's capabilities.
- Arrange to have routine meetings among key members of your staff and the vendor's. These meetings allow problems to be aired before they explode into crises.
- Ensure that joint agreements are documented and signed by both parties. The key document is the specification and statement of work. Other important documents are interface agreements and escalation and troubleshooting procedures.
- Provide suppliers with positive and negative motivation. However, follow the basic management principle of "congratulate in public, admonish in private." In other words, state achievements aloud so the vendor knows you are happy with its performance. Joint press releases are an excellent carrot to offer. If there is a performance problem, make direct contact via telephone and follow it up in writing. Do not foster bitterness by airing dirty laundry in the media. ■

Elbert is director of operations for a large communications company and the author of several books on telecommunications and information technology.

RFP alternatives can help speed decisions

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man's request for recommendation (RFR) is easier and quicker to put together than a standard RFP because it focuses on the firm's business needs rather than on detailed technology needs.

"In the standard RFP, the writer is not seeing the forest for the trees. All of the focus is placed on details, and the overall mission is lost," said Buchman. "How management determines if this system will meet their business needs is, after all, the most important consideration."

Buchman said a good request to vendors includes the company's needs, such as its long-term business goals and its func-

tional requirements.

A good vendor response explains how the company can meet the business needs through a brief systems and support description.

John Dinan, telecommunications specialist at the Santa Clara County Office of Education, said a more generic RFR — also known as a request for information (RFI) — is useful only if a company lacks its own in-house expertise.

"I have my own in-house specialists so I prefer the standard RFP where I design my own system and outline my specifications to the vendor," said Dinan. "If you don't have the expertise to do that, an RFI that gives a business plan is a good way to avoid hiring a consultant and to have the vendor do your work for free."

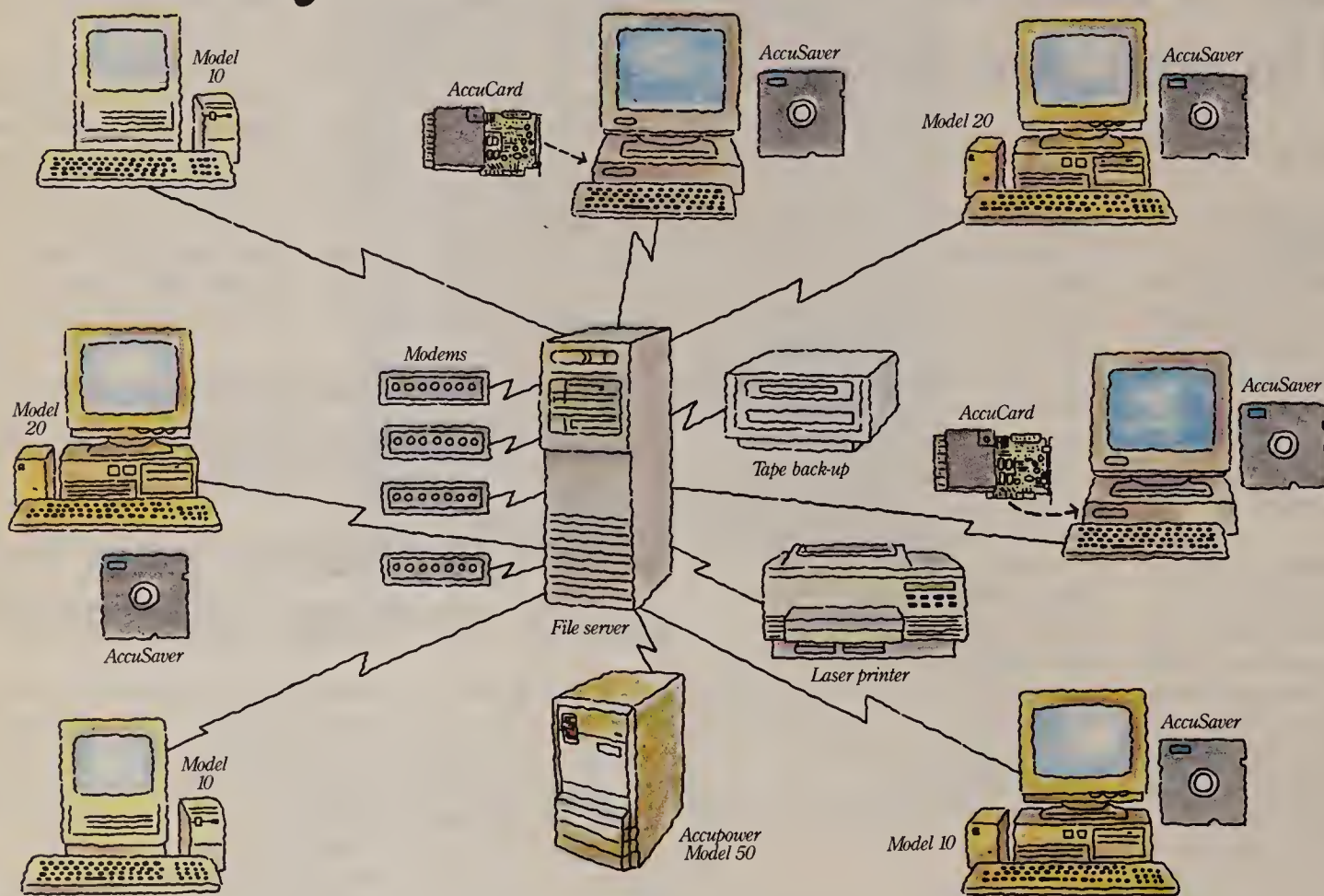
Guy Hoffman, a vice-president at Eicon Technology, a wide-area network manu-

Buchman said a good request to vendors includes the company's needs and its functional requirements.

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facturer in New York, said the number of detailed RFPs that land on his desk is declining — a trend he welcomes.

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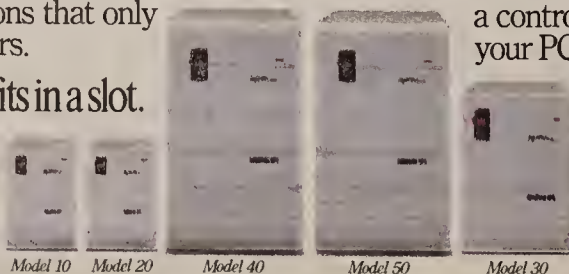
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"RFPs are a nightmare . . . a bear to write and a bear to read," he said. "I'll be happy if I never see one again."

Trudy Ririe, network manager for Los Angeles County, said a minor imprecision in language can throw a monkey wrench into the entire RFP process.

"The first time I wrote an RFP for long-distance service, I thought I was being very clear. But it turned out I wasn't, and what came back from the vendors was useless," she said. "I don't know that it can be done, but it would be nice if there were a better way to compare vendors' services."

Lionel Gillerman, manager of network technology at McDonnell Douglas Aerospace Information Services Co., said he dislikes RFPs because they are too easily misunderstood by the vendor.

"If you don't define your problem properly, you won't get good results," said Gillerman, who noted that users can better avoid this trap by keeping the RFP as general as possible. "The more detailed you get, the more you restrict how a vendor can respond to you."

All agree that a change in RFP format or a speeding of its process is ultimately the user's responsibility.

"It's a buyer's issue," said Eicon's Hoffman. "It's the user who's putting out the money so [vendors] are bound to follow whatever terms the user lays out." ■

Training in team building critical

continued from page 23

puter Task Group in Needham Heights, Mass. Teams that do not have a strong administrator will lose sight of their objectives. "Every team needs a strong administrator who understands corporate goals and puts in place well-defined objectives to achieve those goals," Springer said.

Besides leadership, many companies think it is important to include vendors and end users as part of their network teams. The telecommunications department at Gannett Co., for example, views the vendor as an extension of its department when rolling out new systems in subsidiaries across the country.

"We rely on the telephone company and other service providers to represent us before our [end] users if that's called for," said Bill Hider, vice-president of telecommunications at Gannett.

Users are key

Including end users on a network team is critical when the group is developing a new system that will affect user operations, said Jeff Lipton, director of office support and telecommunications at the University of Colorado at Boulder.

Putting end users on a network team helps focus the group and ensures that applications meet their needs.

"It's tempting for a group of technical people to work on a project in a bubble and apply technology for technology's sake," Lipton said. "Including [end] users on a team prevents that."

"Until recently, network development [within both user and vendor firms] has been dominated by the entrepreneurial efforts of a single individual — a lone ranger type," said McDonnell Douglas' Gillerman.

"But our industry has matured to the point where such development requires the composite knowledge of many individuals working together as a team," he added. ■

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Worth Noting

AT&T Network Systems Group recently announced plans to supply two 5ESS central office switches to Egypt's national carrier, ARENTO. The \$12 million deal marks the first time 5ESSs have been sold in the country. Each switch will have an initial capacity of 30,000 lines and will be used to provide net services to Cairo, Egypt.

World News

Infonet Services Corp. last week said it has interconnected its international value-added network (VAN) with the U-Net VAN in Japan operated by Nippon Unisys Company, Ltd., a computer marketer based in Tokyo.

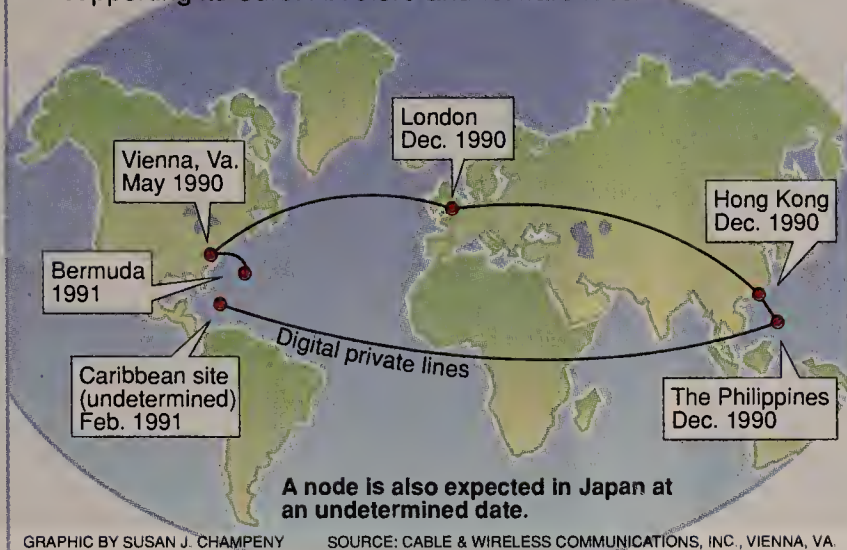
One of the first users of the interconnection, according to Infonet, will be Applied Materials, Inc., a Santa Clara, Calif.-based maker of semiconductor manufacturing equipment. Applied Materials will use the Infonet and U-net link to carry data between host computers in Santa Clara, sales and field office locations in Japan and a manufacturing plant in Horsham, England.

US Sprint Communications Co. recently said it received a \$10 million, five-year contract to supply to the Pentagon a transatlantic T-1 circuit running over the Private Trans-Atlantic Telecommunications-1 undersea fiber-optic cable.

The circuit will connect Pentagon headquarters in Arlington, Va., with the Hillingdon Royal Air Force Base in Uxbridge, England. As part of the deal, US Sprint will supply the Pentagon with T-1 multiplexers and encryption equipment and will handle network operations and maintenance of the link. **Z**

Cable & Wireless' planned global fax net

Countries where Cable & Wireless plans to operate nodes supporting its SureFAX store-and-forward facsimile service



Carriers, IVANs bolster international fax services

Overseas nodes promise to reduce user costs.

By Barton Crockett
Senior Editor

Carriers and value-added network suppliers are extending the international reach of store-and-forward facsimile services, a move that should lower rates and improve performance levels.

By establishing store-and-forward facsimile nodes in foreign countries, service providers can use international private lines to carry fax traffic from the U.S. to nodes abroad, thereby lowering operating costs since traffic no longer flows over international dial-up facilities.

Service providers say they can pass on the savings to users in the form of lower rates.

The addition of store-and-forward nodes abroad also improves service levels by giving customers abroad local access to U.S.-based fax services. Without a local node, users abroad can only access U.S.-based fax services by placing international phone calls to U.S. nodes, which is so difficult and expensive that few users bother.

Alternatively, users can rely on foreign-based fax services, which may or may not offer U.S. connections.

Despite the fact that foreign nodes improve the quality and decrease the price of international facsimile services, carriers are only now beginning to install them, mostly because store-and-forward fax services are so new.

For example, just last summer, AT&T opened its first store-and-forward facsimile node outside the U.S. That installation, in London, was soon followed by another in Tokyo.

Lynda Sperry, manager of global messaging services at AT&T in Bridgewater, N.J., said a third foreign node is planned for

Toronto in 1991 and other foreign nodes are planned for Europe and the Far East.

AT&T only began offering its store-and-forward fax service, dubbed Enhanced Facsimile, in late 1989.

"Clearly, you need to have an access and regress point locally," Sperry said. "That's what makes the service attractive."

Sperry said establishing for-

Last summer, AT&T opened its first store-and-forward facsimile node outside the U.S.

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foreign nodes lowers AT&T's operating costs by eliminating the use of international dial-up facilities to send faxes abroad. AT&T then passes these savings on to users.

For example, she said that when AT&T first cut over Enhanced Facsimile, its standard charge for service to the U.K. was \$1.70 for the first page transmitted and 88 cents for each additional page. When AT&T cut over its London node, charges dropped to \$1.36 for the first page and 70 cents for each additional page.

Sperry said the primary reason for the reduction was the lower operational costs realized by routing faxes over transatlantic private lines to the London node.

Other carriers, such as Cable & Wireless Communications, Inc., based here, also plan to set up store-and-forward facsimile (continued on page 30)

Canadian users hail new net resale rules

Users say regulations will encourage resellers to offer service in competition with local carriers.

By Barton Crockett
Senior Editor

MONTREAL — Attendees at the recent annual conference of Canada's leading user group said major changes in network resale regulations promise to improve competition and provide new options for low-cost services.

Regulations enacted late last May by the Canadian Radio-television and Telecommunications Commission (CRTC) — the nation's principal regulatory agency — are breathing new life into the Canadian resale industry by eliminating prohibitions against serving multiple users over a single analog leased line, or 56K or 64K bit/sec circuit.

Due to the new regulations, Canada's network reseller ranks have swelled from about six to roughly two dozen, according to Lis Angus, executive vice-president of Angus TeleManagement Group, Inc., a consulting firm in Pickering, Ontario. Angus said Canadian resellers are offering users discounts of 20% to 50% over standard switched voice services from Canada's monopoly local carriers.

Given that there is currently little competition for local carriers,

users, users say the resale market will offer the most effective network competition in Canada.

"Resale is changing the market enormously by opening up new competitive possibilities," said Tom Egan, manager of telecommunications with Canadian Tire Acceptance, Ltd. in Welland, Ontario.

According to Brian Callihoo, manager of telecommunications at John Labatt, Ltd. in London, Ontario, and president of the Canadian Business Telecommunications Alliance, which sponsored the TeleCon '90 conference here last month, "Resale is important because it's something that's available now."

Currently, the only competition to Canada's local carriers comes from resellers and carriers such as Unitel Communications Co. and BC Rail, Ltd. that use their own facilities to provide private network services.

This may change if the CRTC approves a petition from Unitel, and BC Rail in conjunction with Lightel, Inc. to sell switched long-distance services over their own facilities. But even if the proposals are approved, the new carriers (continued on page 30)

Canadian carriers mull cross-border rate changes

TORONTO — Canadian carriers are considering tariff changes for U.S.-bound private lines that could significantly increase rates for some users while decreasing them for others.

The changes, which are currently being examined by Canada's dominant local carriers through an organization called Telecom Canada, involve the way distance charges are calculated for the Canadian half of private lines running to the U.S.

Under proposed changes, prices for the Canadian half of transborder private lines would be calculated by drawing a theoretical line between the Canadian and U.S. nodes and measuring the distance from the Canadian node to the point where the line crosses the border.

Currently, the Canadian half of a transborder private line is priced based on the distance from where the private line begins to a

so-called border crossing point, where the private line physically enters the U.S.

Significant changes

According to Michael O'Hara, product manager for international private network services at MCI Telecommunications Corp., equal numbers of users would, in theory, experience price increases and decreases. He added, however, that most users would see their prices change significantly one way or the other.

A Telecom Canada official, who requested that his name be withheld, confirmed that the change is being considered but cautioned that no decision has been reached yet.

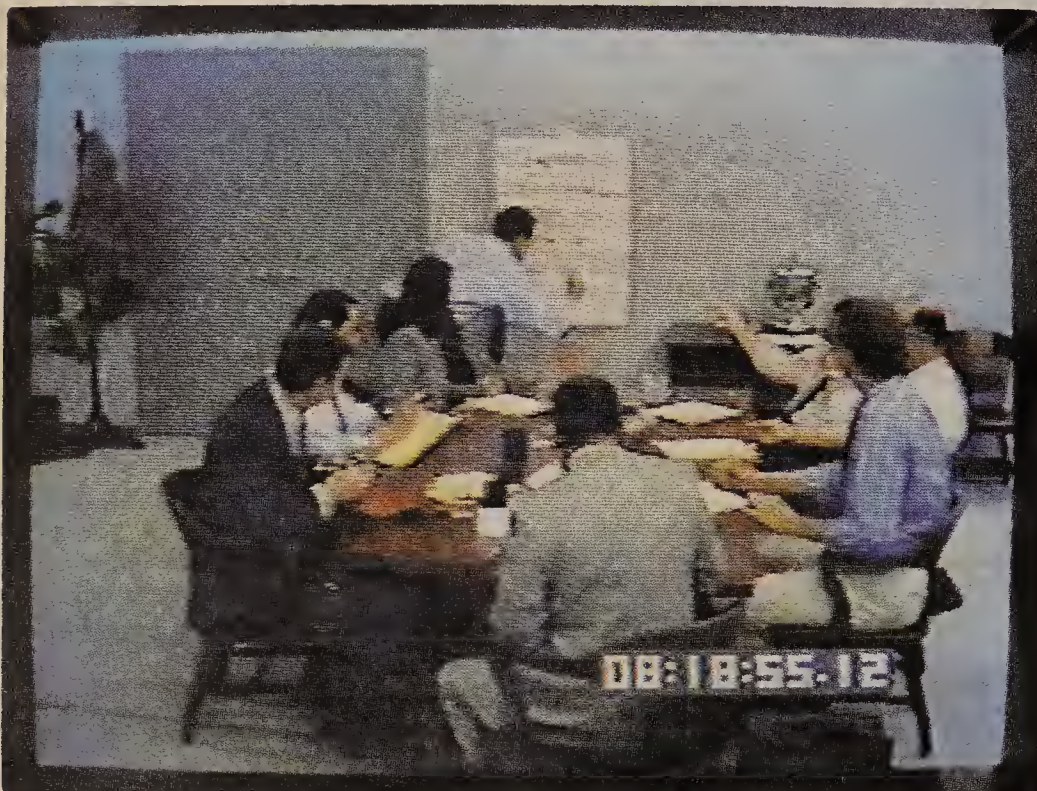
The Canadian Radio-television and Telecommunications Commission (CRTC) — Canada's principal regulator — would have to approve any tariff (continued on page 30)



"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."



"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."



"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."



"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers to talk about their wildest desires in a personal computer system.

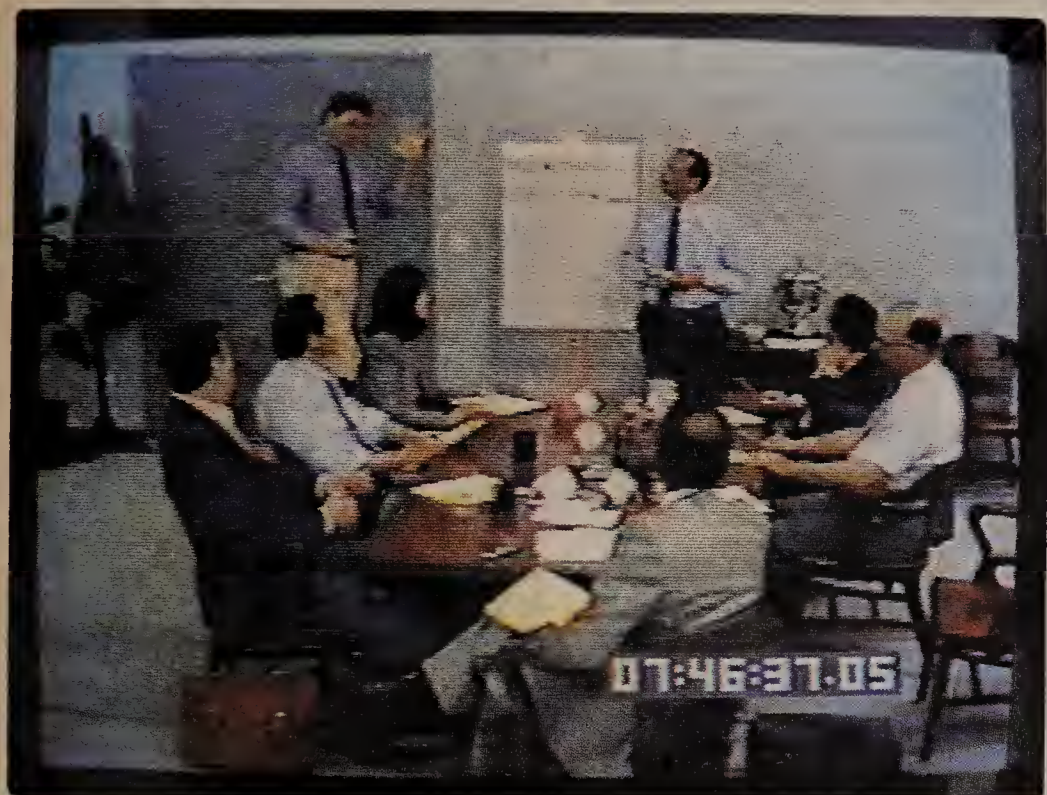
They talked. We listened. We videotaped. And when we got those tapes back to Silicon Valley, popped them in the VCR and started watching, it confirmed what we knew all along.

They wanted a personal computer system that was compatible enough with their existing PCs to trade files on floppy disks. Like Macintosh®.

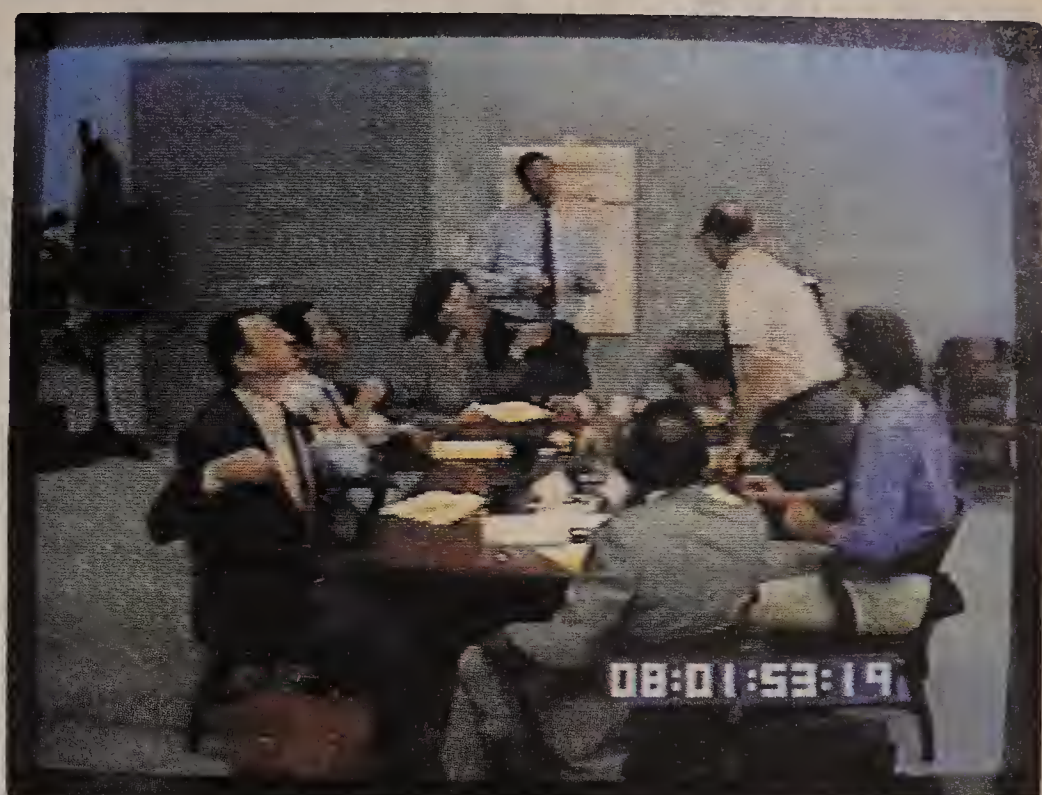
They wanted a system with the power and flexibility to run thousands of business programs and almost any kind of operating system: MS-DOS, Macintosh and UNIX®. Like Macintosh.

They wanted a graphical user interface with no compromise in performance. Like Macintosh.

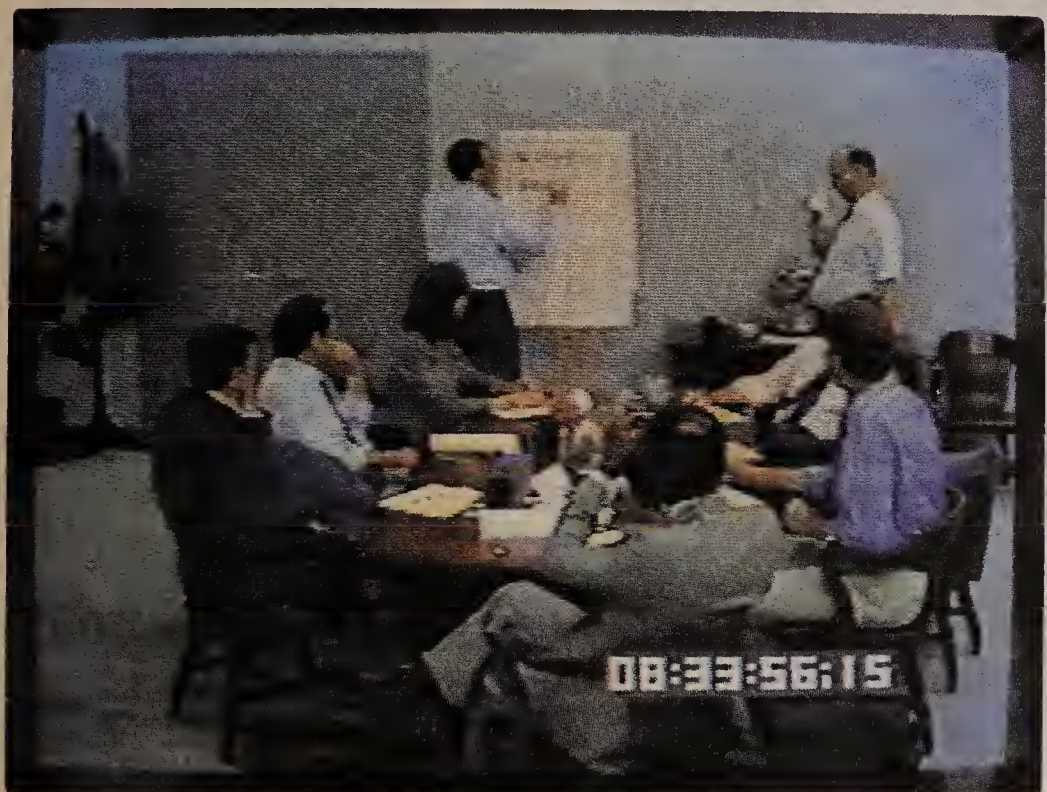
And they wanted all their software to have a single way of working, so training and support costs could be dramatically lower. Like Macintosh.



"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."



"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."



"Macintosh? No kidding?"

secret desire of 200 IS managers.

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and easily. Like Macintosh.

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Carriers, IVANs bolster fax services

continued from page 27

nodes around the world and to lower international fax transmission rates.

Currently, Cable & Wireless' SureFAX service is only available from a single node in the U.S. The service began operating last July.

Cable & Wireless plans to open other SureFAX nodes both domestically and internationally during the next two years, according to Thomas Malone, Cable & Wireless' assistant vice-president of business development for SureFAX. The foreign nodes will first be placed in countries where parent company Cable & Wireless PLC owns the local carrier, such as in Hong

Kong and Bermuda, he added (see graphic, page 27).

Malone predicted that the addition of foreign nodes will make Cable & Wireless' SureFAX service a favorite of international users.

"One of the biggest international network applications is facsimile," he said. "And we think there will be quite a market for store-and-forward services like ours that keep users from dealing with all of the transmission problems of international facsimile."

Malone also predicted that within two years, international fax services could offer lower transmission rates than standard international dial-up facilities.

Major U.S. international value-added network (IVAN) providers also plan to im-

prove their global store-and-forward facsimile services by revamping their networks to accept transmissions directly from fax machines. Currently, most major IVANs will only accept facsimile traffic in the form of computer files, often in ASCII format. They then transmit these files across their nets.

Accepting transmissions directly from fax machines will make IVAN store-and-forward facsimile services more readily available and more attractive to many users. Among the IVANs planning to make this change is SprintNet, according to a US Sprint Communications Co. spokesman. He declined to specify, however, when SprintNet will begin accepting transmissions at foreign nodes directly from fax machines. □

Canadian users hail new net resale rules

continued from page 27

would need years to set up effective nationwide services ("Canadian firms seek OK to offer long-distance services," NW, Sept. 10).

New focus on U.S. resale

According to Angus, even though the new resale rules do not directly affect resale services to the U.S., they could make carriers that provide these services more financially viable.

Angus said the new resale rules do not directly affect resale service to the U.S. because the restrictions on multiple users per circuit didn't apply to resale services to the U.S. For this reason, she said most of the six resellers operating in Canada prior to the rule change focused primarily on service to the U.S.

The inception of effective nationwide resale services will make Canadian resellers carrying traffic to the U.S. more financially stable because they will have a broader customer base.

But even though resellers are opening up new network opportunities in Canada, they also face the possibility of a market shakeout, mirroring a similar resale shakeout that hit the U.S. after resale was first permitted.

Likewise, Canada's dominant carriers are about to adopt rate cuts of up to 70% on private lines along with large cuts on switched service prices that could wreak havoc with reseller profit margins.

According to Michael O'Hara, product manager for international private networks at MCI Telecommunications Corp., "It could make the whole industry evaporate." □

Canadian carriers mull rate changes

continued from page 27

changes before adjustments could be made.

In a related move, Canadian regulators are examining possible changes to regulations governing transborder bypass.

Transborder bypass is when users route traffic from a node in Canada to a node in the U.S., where an American long-distance carrier then transports it across the U.S. to the local Canadian carrier closest to the call's destination. This practice is used to circumvent high Canadian long-distance rates.

Users report that this kind of bypass can cut long-distance network bills by 50% or more. But Canadian regulators prohibit it because of fears that users would flee Canadian long-distance services in favor of those from U.S. carriers.

Enforceability questioned

In a Sept. 4 document, however, the CRTC asked for public comments on the enforceability of this restriction, among other things. Many users report that this restriction cannot be effectively enforced and is widely violated.

Mairi MacDonald, legal counsel at the Canadian Business Telecommunications Alliance, a user group based here, said if the CRTC rules that the restriction cannot be adequately enforced, it may be dropped or lessened. But she cautioned that it is impossible to predict how the CRTC will rule on this issue or if it will even take a stand. □

To join local area networks together, LAN administrators have traditionally relied on bridges, routers, repeaters, gateways, and enough wires to give birth to a small electric company.

This arrangement didn't

make for the most efficient of systems. It was expensive. Impossible to reconfigure. And it created more bottle-necks than the LA Freeway.

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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

GammaLink enhances facsimile software

GammaLink, Inc. recently announced several enhancements to its line of GammaNet personal computer facsimile software.

The company announced **GammaNet Version 1.1**, an upgrade to its local-area network software that works in tandem with GammaFax interface cards, allowing LAN users to send and receive faxes from workstations.

Version 1.1 now supports push-button automatic routing of incoming faxes and direct-inward dial (DID), which enables LAN users to have individual fax numbers. DID also lets fax senders direct a transmission to a specific node on the network without calling a general number and directing the call to the fax recipient.

Users must install the new GammaFax CPD for DID support and the new GammaFax DFX daughterboard to support push-button routing. The DFX board is installed on the company's existing GammaFax interface boards.

Push-button support allows fax senders to direct a fax to a specific recipient by entering an extension number after the call has been established. This works in a manner similar to a private branch exchange or a call processing system.

Both the CPD and DFX boards support CCITT error correction, which enables them to check a block of fax data for errors. In order to perform error correction, both the sending and receiving fax modems must support it.

Version 1.1 also features support for the Digital Communications Associates, Inc./Intel Corp. Communicating Application Specification, which lets users send faxes from within a compatible application such as Lotus Development Corp.'s 1-2-3.

GammaNet Version 1.1 is expected to be available this month for \$1,195. GammaFax CPD and GammaFax DFX should be available in the fourth quarter for \$1,395 and \$295, respectively. The optional GammaNet for Windows is expected to be available next month for \$245.

GammaLink, Inc., 133 Caspian Court, Sunnyvale, Calif. 94089; (408) 744-1430. ☐

Wellfleet's third-party SNMP support

Vendor equipment that can be monitored and controlled by Wellfleet SNMP-Network Management Software Release 2.0

Vendor	Product
Advanced Computer Communications	ACS 4130 IP Router
cisco Systems, Inc.	IGS, CGS, MGS and AGS routers
Novell, Inc.	LANtern network monitor FastPath 4 Gateway
Proteon, Inc.	p4100 Router Series p4200 Router Series
SynOptics Communications, Inc.	Model 1000 Premises Concentrator LattisNet System 3000
Xylogics, Inc.	Annex terminal server

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: WELLFLEET COMMUNICATIONS, INC., BEDFORD, MASS.

Wellfleet's SNMP software supports third-party MIBs

Enables users to manage multiple vendors' gear.

By Tom Smith
New Products Editor

BEDFORD, Mass. — Wellfleet Communications, Inc. last week announced a new release of its Simple Network Management Protocol (SNMP) software that can manage equipment from six other vendors that support SNMP.

By supporting other vendors' SNMP management information bases (MIB) in its SNMP-Network Management Software (NMS) Release 2.0, Wellfleet will enable customers to monitor and control third-party devices from a single net management workstation. MIBs are data bases located within an SNMP agent residing on network devices. They define the set of variables, controls and test points supported by the equipment.

Until now, few vendors have offered support for other suppliers' SNMP agents and their MIBs, making multivendor SNMP management impossible for users. Wellfleet's software now sup-

tion session with a cisco Systems router, for example. The control functions, such as reconfiguring a device, were offered in the previous release of the product. The extent of these functions depends on the capabilities offered by the specific vendor.

SNMP-NMS Release 2.0 now supports software configuration reporting.

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SNMP-NMS Release 2.0 also now supports software configuration reporting, which allows net managers to display a node name, software release level and the installed software options. SNMP-NMS previously supported that capability for hardware only.

In addition, Wellfleet has added support for a window to display information about events occurring on the network.

That window is displayed in real time, but the information is also stored for historical report generation. In the past, users could only see a listing of events for specific devices by polling them.

SNMP-NMS Release 2.0, which runs on a Sun Microsystems, Inc. workstation, is available now. It costs \$15,000, but current users can upgrade free of charge.

Wellfleet can be reached by writing to 15 Crosby Drive, Bedford, Mass. 01730, or by calling (617) 275-2400. ☐

Until now, few vendors have offered support for other suppliers' SNMP agents.

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ports MIBs from cisco Systems, Inc. and Novell, Inc., among others (see graphic).

In addition to the MIB support, Wellfleet's SNMP-NMS can perform control functions by establishing a Telnet terminal-emula-

Racal-Milgo rolls out fractional T-1 mux

Vendor also unveils upgraded CMSView release supporting latest version of IBM's NetView/PC.

By Tom Smith
New Products Editor

SAN DIEGO — Racal-Milgo last week introduced a fractional T-1 multiplexer and enhanced software that supports IBM's latest NetView/PC network management interface.

Announced at the Tele-Communications Association, Inc. conference here, the new products are Omnimax FT1, a low-end fractional T-1 multiplexer, and Communications Management Series (CMS)View/II, a software enhancement that lets the CMS 400 management system be controlled by IBM's NetView.

Omnimax FT1 is available in three-, five- and 10-slot configurations; a base configuration supports four data terminal equipment (DTE) ports. The new multiplexer complements Racal-Milgo's Omnimax 8000, a mid-range fractional T-1 multiplexer with 16 slots that supports 64 DTE ports.

Omnimax FT1 is designed primarily for point-to-point and point-to-multipoint configurations, whereas Omnimax 8000, with its auto-rerouting functions, is better suited for mesh nets.

Both devices support time-division multiplexing that terminates a full T-1 line, with users paying for the amount of bandwidth they utilize in multiples of 56K or 64K bit/sec.

The new Omnimax FT1 comes standard with a two-card interface set. One card comes with an integral data service unit/channel service unit that terminates the T-1 line; the other supports four data channels, which can be V.35 or RS-422 ports.

Users have two options for utilizing the remaining slots. In the five- and 10-slot chassis models, they can add extra two-card sets, in which case they can increase the bandwidth supported by the multiplexer.

Alternatively, users can install a Racal-Milgo Omnimax TDM, a single-card time-division multiplexer that supports bandwidth ranging from 56K to 384K bit/sec, as well as two RS-232 ports for DTE.

The Omnimax TDM will be physically connected from its wide-area port to one of the V.35 ports on the FT1 so that data supported by the Omnimax TDM is routed over the wide-area network through the FT1.

Users can install additional

voice and data interfaces into the FT1 that are supported by the Omnimax TDM, but those cards can only be used with the Omnimax TDM.

Pricing for the Omnimax FT1 begins at \$4,500 for a base configuration on the three-slot model. Shipments are expected to begin in the fourth quarter.

Net management upgrade

Racal-Milgo also announced a new release of CMSView/II, its NetView/PC interface software.

The release sends alarms about Racal-Milgo hardware to a NetView console and enables the NetView operator to issue commands to Racal-Milgo's CMS 400 modem management software so it can take corrective action. Previously, the NetView operator was unable to issue commands to the CMS 400.

CMSView/II runs on a personal computer under IBM NetView/PC Version 1.2.1 and provides the interface between NetView/PC and Racal-Milgo's CMS 400.

Racal-Milgo previously offered CMSView, which worked with its earlier generation CMS 2000 management system. The new software has been upgraded to work with the latest version of NetView/PC, which is OS/2-based and, therefore, multitasking. CMSView/II also supports the conversion of alarms generated by CMS 400 to NetView format so a NetView operator does not need to know CMS 400 commands, as was required with the CMSView product.

CMSView/II is expected to be available in the fourth quarter for \$4,500.

Marketing pact with MCI

Finally, Racal-Milgo announced a joint marketing agreement with MCI Communications Corp., whereby MCI will market the vendor's Excalibur data service units and modems, as well as the CMS 400 management system. The carrier will also market Racal-Milgo's net design services, which include installation, optimization and maintenance.

Racal-Milgo will market MCI's point-to-point digital data service and its point-to-point and multipoint digital private-line service.

Racal-Milgo can be reached by writing to 1601 N. Harrison Pkwy., Sunrise, Fla. 33323, or by calling (305) 592-8600. ☐

OPINIONS

JOB HUNTING

BY MARC BUSCH

Is there really life after the pink slip?

If you're like me, you've had a tough climb up the corporate "techie" ladder. Probably more than a few companies have either discarded you — or you have discarded them — for one reason or another.

Maybe you feel that you've been victimized by an uncaring, faceless, three-piece suit at least once in your career. Were you fired at one time because of some accountant's Monday morning whim to carry out a departmental, regional or corporate cost-trimming consolidation? Did your previous employers' top management use excuses such as "Cut out inefficiencies" or "I work best with people who I select personally?"

I believe that directly at fault in these situations are poor management skills and the traditional American management inability to relate to the worries and essential concerns of the network professional in a corporate environment.

The networking industry is not doing well at keeping employees happy and productive. Some reasons for this are that these workers are underpaid, overworked, undertrained, have limited possibilities for advancement into management and are typically performing in

There are no easy answers, but there are steps net managers can take to keep their employees happy and productive.

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a high-visibility, high-risk position.

What can be done about this problem? There are no easy answers, but there are several steps network managers can take to keep their employees happy and productive.

- Reassess compensation for your employees. That means salaries, as well as benefits.
- Improve lines of communication with your employees. For example, consider giving them more frequent job appraisals and combine them with salary reviews.
- Reassess your staff's current work load and hire additional staff if necessary to relieve employee stress levels.
- Consider hiring temporary consultants or subcontractors to help out with task completion during peak work load periods.
- Increase training time for employees.
- Familiarize employees with long-term technological information. This will enable them to see how their daily tasks affect the future of the corporate network and how different technologies relate to one another on the network.
- During confrontations with other departmental managers and staff, stand up for your employees, especially when they are put into a lose-lose situation just because they are trying to do their jobs.
- Together with your employees, formulate a plan to increase their job responsibilities and participation in problem solving. This will open up the lines of communication and, as the Japanese have demonstrated in recent years, show your employees that you value them as people first and employees second.

For example, when expanding your staff to handle increased work loads, have your most experienced people help with the interviewing and screening process. This will foster a smoother, more productive working environment.

As an employer, remember that only by addressing the above-mentioned management issues with creativity and flexibility can you hope to attract and keep good employees. ■

Busch is a senior engineer at Filenet Corp. in Costa Mesa, Calif.

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EDITORIAL

FCC implements LEC price cap plan despite user protest

Customers of the local exchange carriers — users and long-distance providers — have repeatedly expressed grave reservations about the Federal Communications Commission's original local exchange carrier price cap proposal.

Both groups should have been given ample opportunity to assess and comment on the specific details of the price cap plan before the FCC approved this major regulatory change. They didn't get a chance to do that though.

In the coming months, users and others will carefully pore over the as yet unreleased text of the FCC's price cap plan for local exchange carriers, trying to determine how the plan, which takes effect Jan. 1, will affect them.

Last month, shortly before the FCC voted to adopt price caps for the local exchange carriers, a coalition of 29 major corporations, user groups, long-

distance carriers and other organizations asked the FCC to postpone a decision until the commission could provide a more detailed plan. Reportedly, some forces in Congress also considered urging the FCC to move more slowly with price caps.

Critics charged that the plan, as sketched out by the FCC in past months, will cost users millions of dollars in coming years and lead to deterioration of the public network.

As a result, the commission made significant changes to the local exchange carrier price cap plan before adopting it. Such changes include increasing the productivity factor on which rate increases are based, reducing the local exchange carriers' allowable rate of return and creating a new service category — or basket — for special access services to prevent strategic pricing for these important offerings.

But the FCC adopted the plan before giving users adequate time to assess what effect these changes will have in the future. Certainly, the proposal was approved before any kind of industry consensus was reached on the merits of price caps for local exchange carriers.

Despite the FCC's assurances of the future benefits that will result from this incentive-based regulation, users remain convinced that local exchange carrier price caps are not in their best interest.

We applaud the FCC's goals of promoting competition and improving the public network. But with price caps, the commission has not adequately addressed the concerns of users and has moved forward despite vehement protests and repeated calls for restraint.

This may undermine user confidence in the FCC. It may also undermine support for its policies. ■

OPINIONS

MANAGEMENT ISSUES

BY JAMES KOBIELUS

Facing the challenge of keeping up with technology

Many of us information technology professionals feel overwhelmed by the pace of technological change to the point where we can barely keep up with the publications accumulating in our in boxes. It would be nice if we could declare a moratorium on progress until we've fully digested the last three waves of innovation. Dream on.

Large corporations are also a bit overwhelmed, not only by technological change, but by the competitive possibilities it unleashes. Some new technologies could deliver "killer" applications for an alert competitor. The technology that might "kill or maim" you competitively is the one you didn't hear coming, or so we are led to believe.

One coping strategy some companies have used is to create advanced technology groups (ATG) to explore the business potential of new technologies. These groups perform a surveillance function, tracking new technologies on the market or in the labs.

ATGs often consist of a handful of individuals who have been freed from more mundane projects to play with the technologies most of us have only read about — expert systems, multimedia workstations, voice and handwriting recognition, and neural network computers.

In many cases, the primary goal of ATGs is to produce a continuing stream of dog and pony shows, demonstrations that illustrate the potential applicability of fancy technologies to everyday business problems. The most promising demonstrations serve as the basis for pilot projects and, if the fates allow, may someday be developed and deployed as full-blown corporate information and communications systems.

One problem with ATGs is

Kobielus, a contributing editor to Network World, is a telecommunications analyst with Network Management, Inc., a Fairfax, Va.-based consulting firm.

that they can easily acquire a "country club" reputation — that of a refuge for impractical "propeller heads" who spend other people's money but have little to show for it. Their tenuous grasp on existence often depends on having an enthusiastic corporate patron who stresses long-range thinking, has bought the high-tech vision and has cash to spare.

Under these circumstances, ATGs can seem like a frill, an easy victim in corporate downturns or executive purges. To survive in good times as well as bad, ATGs, like all corporate de-

One problem with ATGs is that they can easily acquire a "country club" reputation.



partments, must be accountable for their results. They must establish a track record of proven successes — well-conceived, well-engineered, well-implemented technologies that have paid off in visible, mainstream corporate applications.

However, one might argue that ATGs, for all their good intentions, are fundamentally flawed in that they limit their technological focus to the new, the unfamiliar and the unproven. They tend to overlook the vast majority of strategic business systems that can be developed through smart applications, recombinations and realignments of more familiar technologies.

What dog and pony show can do justice to technology initiatives such as electronic data interchange, computer-integrated manufacturing (CIM) and very small aperture terminal networks? Their corporate impact is too widespread and diffuse to capture in a flashy demonstra-

tion. They derive their value from systems integration efforts that leverage and extend the capabilities of the existing data processing and network infrastructure.

What's needed are corporate organizations that scan a broader horizon of technology-enabled business opportunities than can the average ATG. User companies should consider creating what might be called systems opportunities groups (SOG). SOGs would differ from ATGs in two fundamental ways:

■ **Broader business mandate.** SOGs are business-oriented and mission-driven. They identify corporate business concerns and then ask what technological initiatives might contribute to those concerns. ATGs take the reverse tack: They identify new technologies and then look for potential applications.

SOG projects and initiatives fall into categories similar to corporate business strategies, such as consolidation (possible SOG initiative: T-1 backbone network); standardization (possible SOG initiative: X.400 electronic mail gateways); automation (possible SOG initiative: CIM); and productivity enhancement (possible SOG initiative: computer-aided software engineering).

■ **Deeper corporate roots.** Rather than technologists, SOG projects are headed by "trail bosses" who consist of one part corporate patron and one part team leader. Trail bosses have strong corporate credentials and influence to provide a novel idea with the ready-made legitimacy it needs in order to be taken seriously. Trail bosses may be business or technical professionals; what's most important is that they have records of accomplishment and service to the business.

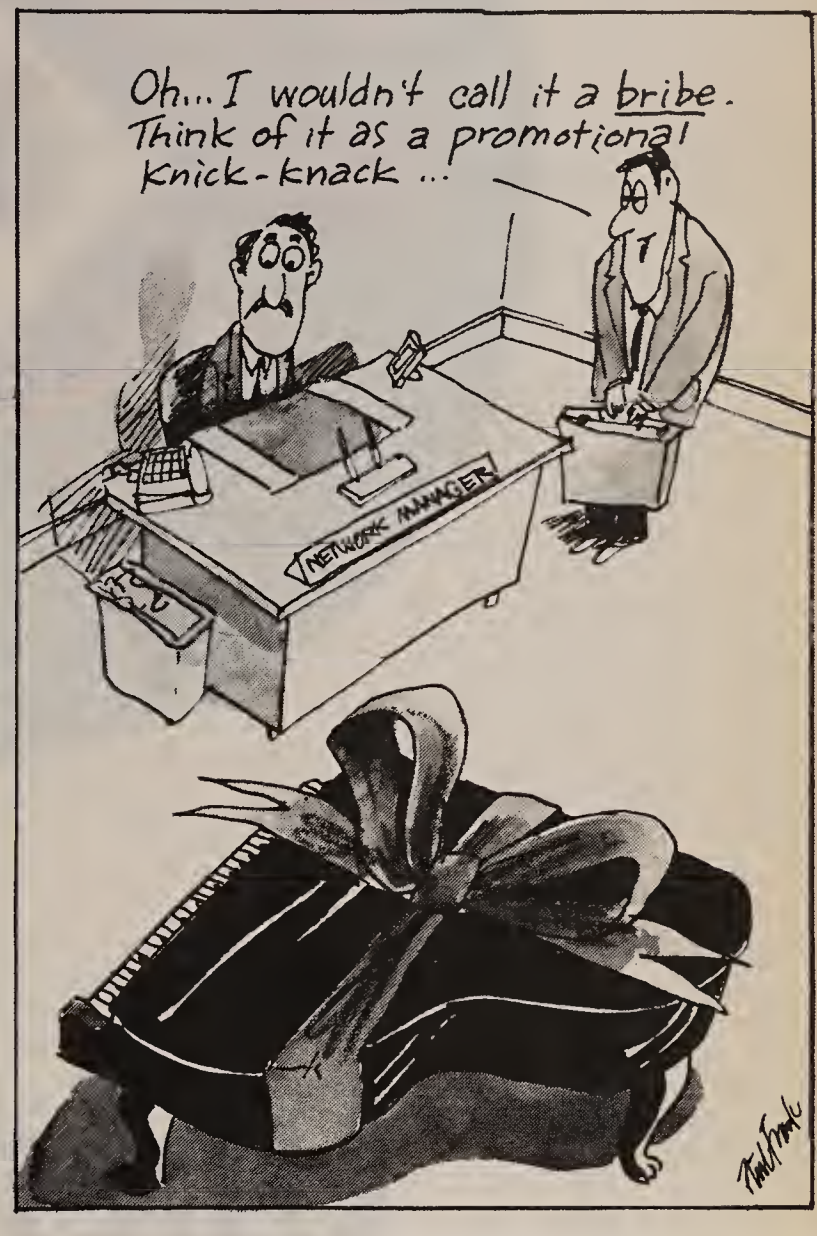
SOGs could be agents of ongoing corporate transformation, a place where mission-critical technological applications find corporate champions to spearhead their acceptance and implementation. ■

LIKE ALLIGATORS IN A SWAMP, unforeseen problems can really put the bite on a communications operation. Many managers find themselves wrestling with these networking reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, assistant features editor, at (508) 820-7413, or fax your idea to us at (508) 820-3467. Alligators should be 1,200 words in length and submitted either on disk or via modem.

TELETOONS

BY FRANK AND TROISE



LETTERS

No simple solution

I read William Robinson's comments on network security ("Needed: A human approach to security," NW, Sept. 3) with some misgivings. I agree with the overall idea that security needs a human approach, but I take issue with the idea that either a technological or people-based solution is the answer.

The first step in reviewing security for an automated system is to do a risk analysis — the "Why are you securing this?" question. Then you move on to the "How can I secure it?" issue that this column touches on.

Controls are designed to balance a threat against the cost of protecting assets from that threat. In the case of electronic mail, the threat is a privacy issue — the unauthorized disclosure of private communication.

The other problem with the column is that it doesn't start with a fundamental review of the problem of securing a network, including the notion that the cost of security should not exceed the cost (or business loss) of the asset to

be protected. Most security professionals use this theory as a rule of thumb.

Encrypting an E-mail network such as the one cited in the article would be considered overkill. The exception here would be if the E-mail network carried information that was of a high risk, such as trade secrets.

Another fundamental point is to differentiate between protective and detective or monitoring types of controls.

Encryption is an example of a protective type of control, which prevents the encrypted material from unauthorized disclosure. These types of controls will not prevent unauthorized use of the network, nor will they detect a threat of attack on the network.

(continued on page 40)

Network World welcomes letters from its readers.

Letters should be typed, double-spaced and sent to Editor, Network World, 161 Worcester Road, Box 9172, Framingham, Mass. 01701.

Letters may be edited for space and clarity.



LAN

OPERATING

SYSTEMS

Operating systems move toward integration

Advances lead
vendors toward
interoperability with
other LANs, mainframes
and mini-based systems.

FROM PAGE 1

Most LANs provide some sort of messaging or E-mail program. Fortunately, there are only a few major E-mail messaging formats, with the two main standards be-

Guengerich is director of publishing and editor-in-chief of technical journals at Houston-based Business Systems Group, Inc., a systems integration firm specializing in planning, implementing and managing networks and distributed applications.

ing Message Handling System (MHS), used to exchange mail between LANs, and X.400, used to exchange mail between Unix systems, minicomputers and mainframes. With products conforming to these standards, users can send mail to and receive it from users of any other system.

Steve Bush, vice-president of consulting services at DataAids, a systems integrator and reseller of Banyan Systems, Inc. products in Houston, illustrates E-mail interoperability using this example: "Banyan makes MacVINES, a pro-

gram that can convert between Banyan E-mail and Quicksilver E-mail on the Mac. Also, a [Simple Mail Transfer Protocol] gateway runs on the Banyan file server and converts SMTP packets from TCP/IP networks into Banyan E-mail and vice versa."

Third parties fill the gap for certain aspects of interoperability that LAN vendors consider to be beyond their mission or scope.

As an example, Bush says, "a gateway made by Trellis Software [a third-party developer for Banyan networks] provides a VINES-

to-NetWare bridge primarily for data sharing. Products like the Trellis gateway provide an option when a company can't migrate, for one reason or another, completely away from one LAN operating system to a new one."

Servers

In some respects, the LAN operating systems introduced and refined over the past year have closed the gap between the raw capabilities of hardware and software. Hardware such as computers based on Intel Corp. 80386

and 80486 microprocessors has stayed ahead of the capabilities of software because few operating systems other than Unix could address 32 bits.

However, recent developments such as IBM and Microsoft Corp.'s LAN Manager 2.0 and Novell, Inc.'s NetWare 386 have begun to catch up with the processing power of Intel chips. NetWare 386, for example, now supports as many as 250 active users, 4G bytes of file server random-access memory, 32T bytes of disk storage, and network volumes and files that span 32 physical disk drives.

Keeping up with hardware

With every new advance in software, there seems to be a corresponding leap ahead in the capabilities of hardware. The advent of network superservers is one such leap.

Tom Henderson, president of Corporate Networks, Inc., a systems integration firm based in Indianapolis, says, "Servers like Compaq Computer Corp.'s SystemPro and Tricord System's PowerFrame are the dream machines of every integrator who has had to put every imaginable type of paraphernalia into a sin-

gle machine." Such superservers support multiprocessors, hundreds of megabytes of RAM as well as storage capabilities into the gigabytes using drive-array technologies to increase speed and reliability.

However, many integrators note that for superserver architectures to be successful, they will need to have one of the key ingredients of desktop and other traditional personal computer servers — a standard, flexible, expandable architecture.

According to Henderson, "NetFRAME [Systems, Inc.]'s architecture, despite its enhancements, is less expandable than Compaq's or Tricord's because it forces you to use NetFRAME [network interface cards].

"However," he continues, "with the SystemPro or PowerFrame, you can use [Industry Standard Architecture/Extended Industry Standard Architecture net interface cards] from a wide variety of third parties." The type of expandability that can be achieved with the SystemPro or PowerFrame is important because the user is not limited to one vendor's proprietary hardware.

While many systems integra-

tors view 80486-based personal computers and superservers as a way of increasing LAN performance, others point to the more fundamental issue of bottlenecks. According to Eric Pulaski, president of the LAN Support Group, an application development and systems integration firm in Houston, "The most important thing [affecting a server's performance] is the bus."

With more users demanding I/O and more applications requesting large data chunks, an 8- or 16-bit ISA card may reach its load limitations quickly, Pulaski says. Therefore, "for large networks, you simply don't want an ISA bus — you want to have an EISA or Micro Channel Architecture [MCA] bus" because the EISA or MCA bus can take full advantage of 16- and 32-bit data transfer capabilities.

MCA and EISA

Most of the vendors in the personal computer market that are serious about server systems offer MCA and EISA. For example, Advanced Logic Research, IBM and NCR Corp. offer 80486-based MCA servers, and others such as AST Research, Inc., Compaq and Dell Computer Corp. offer the

same processors in EISA machines.

Network management

As LANs become more complex and begin to interoperate, the need for adequate network management tools arises. Most

CHART • GUIDE

A Buyer's Guide chart comparing the different features of various local-area network operating systems begins on pages 36 and 37, and continues on pages 38 and 39.

LAN operating systems provide integral network management features such as problem detection, determination, isolation and reporting. However, the information gleaned using these features typically has been used for troubleshooting, basic performance monitoring and tuning.

Relying solely on these barebones management tools can cost companies in terms of LAN downtime. According to a 1989 study by Infonetics, Inc., a market research firm located in Santa
(continued on page 38)

NETWORK WORLD

Local net operating systems

Vendor	Product	Operating system type	Net adapters supported	Supported file server CPUs	File server RAM requirements	Maximum RAM supported (bytes)	Total hard disk storage addressable (bytes)	Workstation OS	Minimum workstation RAM (bytes)	Maximum number of connections per file server	Fault tolerance
Artisoft, Inc. Tuscon, Ariz. (602) 293-6363	LANtastic Local Area Network	DOS	Artisoft 2M bit/sec and Ethernet adapters, other manufacturers' NETBIOS compatibles	IBM PC, XT, AT, PS/2s, 386s	40K	No limit	No limit	DOS	12K	300	Uninterruptible power supply, third-party vendors' disk mirroring and tape backup
AT&T Computer Systems Morristown, N.J. (201) 898-8000	Stargroup LAN Manager Server Version 3.4	Unix System V	AT&T Starlan MAU, Starlan 10 MAU, Starlan 10 EN 100, Starlan 10 MC 200, Starlan 10 Fiber NAU, IBM 16/4 Token-Ring Network Adapter and Adapter A, 3Com Etherlink I + II, InterLAN NIS210, Proteon, Inc. P1347, P1390, P1990	Server 386, +486, 382	6M	Server: varies by machine, no real limit; client: machine dependent	Limited by hardware	OS/2, DOS, Unix, Apple Computer, Inc. Macintosh	130K, of which approximately 80K can be loaded into expanded memory	256	Uninterruptible power supply, disk mirroring, disk duplexing, tape backup
Atlantix Corp. Boca Raton, Fla. (407) 241-8108	Atlantix Axxess	Unix	Ethernet, Arcnet, token ring, Starlan, twisted-pair Ethernet	386 or 486 AT, EISA or microchannel	8M	No limit	No limit	DOS, OS/2, Macintosh, Unix, Xenix, NeXT, Sun Microsystems, Inc.	640K DOS, 4M OS/2	255 per server	Uninterruptible power supply, disk mirroring, disk duplexing, tape backup, duplexed processors via Unix
Banyan Systems, Inc. Westborough, Mass. (508) 898-1000	VINES for i486 Platforms	Unix on server, DOS on client PCs	Ethernet, Arcnet, token ring, Starlan, ProNET, Apple LANSTAR, VistaLAN	Intel Corp. i486, 25 to 33 MHz	4M	16M	No limit	DOS	600K	No limit	Uninterruptible power supply, disk mirroring (third party), disk duplexing (third party), tape backup, duplexed processors (third party)
CBIS, Inc. Norcross, Ga. (404) 446-1322	Network-OS	DOS	Over 50 supported: Arcnet, Ethernet, Starlan, proprietary bus, token passing, cluster, diskless boot ROMs	IBM PC XT, AT, PS/2	640K	DOS limit	DOS limit	DOS	512K for performance 60K for software	255	Uninterruptible power supply monitoring, disk mirroring, tape backup (on-line and batch)
Corvus Systems, Inc. San Jose, Calif. (408) 281-4100	ReadyNet	DOS	ReadyNet, OmniNet	8088, 8086, 286, 386, 486, PS/2	170K	1M real mode, 8M EMS	16M on 1 server, unlimited on network	DOS 3.X to 4.X	60K	24	Uninterruptible power supply, tape backup
Digital Equipment Corp. Maynard, Mass. (508) 493-3142	DEC Lanworks for OS/2	OS/2	Controllers supplied with NDIS drivers, device drivers for DEC Etherworks product line included with software, 3Com 3C503 and 3C523	286, 386, 486 AT, PS/2	6M	Hardware-dependent	Hardware-dependent	OS/2, DOS	4M for OS/2 workstations, 640K for DOS	NA	Uninterruptible power supply, tape backup
	DEC Lanworks for DOS	DOS	DEC Etherworks family, 3C503, 3C523	IBM XT, PC, 286, 386	NA	Hardware-dependent	NA	DOS	640K DOS, 4M OS/2	255 per server	Uninterruptible power supply, disk mirroring, disk duplexing, tape backup, duplexed processors through Unix
DSC Communications Corp. San Jose, Calif. (408) 954-5110	NEXOS Operating System	Proprietary	DSC, Novell, Tiara Computer Systems, Inc., D-Link, Corvus, Standard Microsystems Corp., Pure Data, Madge Networks, Ltd., IBM, 3Com, Western Digital Corp.	286, 386 and 486 AT	640K (286), 2M (386)	16M	16G	MS-DOS, PC-DOS 2.0 to 4.01	256K	255 (386)	Uninterruptible power supply, tape backup
IBM Armonk, N.Y. (914) 765-1900	IBM OS/2 Local-Area Network Server	OS/2 Extended Edition	Ethernet, Token-Ring	All 80286-based and above	6M	16M	No limit; not a function of server program	OS/2, MS-DOS, PC-DOS	640K practical minimum; 1M recommended	254 active sessions; no limit to number of nodes	Disk duplexing, on-line tape backup
Microsoft Corp. Redmond, Wash. (206) 882-8080	LAN Manager 2.0	OS/2 at server DOS, Windows, and OS/2 workstations	IBM, 3Com, Western Digital, Novell, Ungermann-Bass	286, 386, 486, PS/2	5M	16M	16T	OS/2, DOS Windows	512K	992	Uninterruptible power supply, disk mirroring, disk duplexing, tape backup
NCR Corp. Dayton, Ohio (513) 445-3909	NCR LAN Manager 2.0	OS/2, DOS	NCR token ring and Starlan, IBM Token-Ring, 3Com Ethernet and token ring, Western Digital Ethernet and token ring	286, 386, 386sx, 486	286-based 5M, 386-based 6M	16M	NA	DOS, OS/2	512K for DOS, 3M for OS/2	1000	Uninterruptible power supply, tape backup, disk mirroring, disk duplexing
Novell, Inc. Provo, Utah (800) 526-5463	Advanced NetWare	NetWare	Supports more than 100 cards	286, 386, 486	2M	12M	2G	DOS, MAC, Windows, OS/2	128K	100	Uninterruptible power supply, tape backup
	SFT NetWare	NetWare	Supports more than 100 cards	286, 386, 486	2M	12M	2G	DOS, MAC, Windows, OS/2	128K	100	Uninterruptible power supply, tape backup, disk mirroring, disk duplexing

APPL = Advanced Program-Program Link
DCB = Disk Controller Board
EDCB = Enhanced Disk Controller Board
EISA = Extended Industry Standard Architecture
EMS = Expanded Memory Specification
ESDI = Extended Small Device Interface

MAC = Media access control
MAU = Multistation Access Unit
MFM = Modified Frequency Modulation
MHS = Novell's Message Handling System
NA = Not applicable
NDIS = Microsoft's Network Driver Interface Specification

SOURCE: BUSINESS SYSTEMS GROUP, HOUSTON

(continued on pages 38 and 39)

Maximum number of open files	Number of network printers	Smart disk controllers	Number of bridges	Mainframe connectivity	Remote communications connectivity	OS/2 support	Macintosh connectivity	Electronic mail	Security features provided	Price
5000	5 per server	Any PC NETBIOS	No number given; third-party NETBIOS supported	Third-party products to IBM	No	No	Third-party products	Yes	Password protection, share level of access, record/file locking	\$525 for 2M bit/sec starter kit, \$725 for Ethernet starter kit
No limit			No limit; external	AT&T Stargroup SNA, synchronous gateway, DEC via TCP/IP gateway or third-party product	X.25 via AT&T Stargroup X.25 router, asynchronous via AT&T asynchronous gateway, Unix on client/server	Native	Yes, via Stargroup Server for Macintosh	AT&T PMX/StarMAIL, X.400	Share mode, resource defined, user mode and user dependent; network log-in required; security attached to resource share names; record/file locking through Unix	8 user, \$1995; unlimited, \$3795
No limit; Unix dependent	5 per server	Yes	9	Third-party IBM, native TCP/IP-NFS from server to DEC	TCP/IP native, third-party gateway to X.25, asynchronous native, all Unix supported gateways	Native	Gateway	No	Password protection, share levels of access, record/file locking, Unix C2-level security and higher supported	\$4595 for a 32-user system
60,000 per server	10	SCSI, ESDI, ST506	9	IBM SNA native, VT emulation and third-party gateway to DEC	TCP/IP, X.25, HDLC, SDLC, asynchronous, SMTP, NETBIOS, Named Pipes MAIL: slots, Unix	Yes	MACMAIL: Gateway, MACLAN Connect (third party)	Yes, optional	Password protection, share levels of access, record/file locking within application, not OS	\$7,490
255 per server	5 per server	Yes	1 internal per server, 3 bridges per network	Third-party products to DEC VAX and IBM	X.25, asynchronous via gateway	No	MACNODE for Macintosh only	Network interface card, intercom utility for use on single network	Password protection, system administration functions and log-on scripts supports Novell record/file locking	\$160 per node
400 per server	No limit	NA	9	Third-party IBM SNA gateway	Third-party gateway to X.25	No	No	NetView Message Service	Password protection, share levels of access, record/file locking	\$249 per node
NA	NA	NA	Internal up to 16; external, no limit	DEC native support	Asynchronous DECnet support	Native	NA	DEC Lanworks for OS/2 Mail	Password protection, share levels of access, record/file locking	Server license, \$295; client license, \$195; media and documentation, \$410
No limit; Unix dependent	5 per server	NA	9	Third-party IBM, Native TCP/IP-NFS from server to DEC	TCP/IP native, third-party gateway to X.25, asynchronous native, all Unix supported gateways	Native	Gateway	No	Password protection, share levels of access, record/file locking, Unix C2-level security and higher supported	\$4,595 for a 32-user system
64,000	8 per server	IDE, DPT, ESDI	9	Third-party IBM NETBIOS gateway	TCP/IP via workstation application, third-party gateway to X.25, simultaneous logon to NetWare 2.1x and PC LAN	No	No	Lifephone	Password protection, share levels of access, record/file locking	286 version: \$495, 8 users; \$995, 24 users; 386 version: \$1,995, 8 users; \$3,295, 255 users
No limit given	No limit		Practical limit of 7 cascaded	Gateway for IBM hosts	X.25 gateway	Yes	Gateway with third-party code	Server-server, server-node, node-node messaging	Password encryption, share levels of access, record/file locking	\$1,040; includes 128 DOS Requestors
8,000	No limit	Any with OS/2 device driver, Compaq, SCSI	NA (supports token ring and Ethernet bridges)	IBM via DCA/Microsoft Communications Server, DEC via DEC's PCSA 3.0	DCA/Microsoft Communications Server gateway to X.25, same for asynchronous, ISDN via Micro-Decisionware DB2 gateway and Micro-Tempus Enterprise Router, TCP/IP native	Yes	Via 3Com MAC client	No	Password protection, share levels of access, record/file locking	\$995 for LAN Manager Server, 5 users; \$995 for 10 user pack, \$5,495 for unlimited user pack
8,000	8	SCSI, ESDI, ST506	7 external, no internal	Third-party gateway	Third-party SNA gateway to X.25, ISDN via add on Communications Server product, SDLC, APPL	Native	No	No	Password protection, share levels of access, record/file locking	\$795 for 5 user base, \$695 for 10 user upgrade, \$3,300 for unlimited user upgrade
1,000	16	SCSI, ESDI, MFM, ISA, EISA, Model 30-286, IBM SCSI, DCB, DCB/2	4; internetwork can support unlimited amount	Gateway, DEC native	Native X.25, native asynchronous	Native	Native	MHS	Password protection, share levels of access, record/file locking	\$3,295
1,000	16	SCSI, ESDI, MFM, ISA, EISA, Model 30-286, IBM SCSI, DCB, DCB/2	4; internetwork can support unlimited amount	Gateway, DEC native	Native X.25, native asynchronous	Native	Native	MHS	Password protection, share levels of access, record/file locking	\$4,995

NFS = Network File System
 NLM = NetWare Loadable Module
 PCSA = DEC's Personal Computer Systems Architecture

PMX = AT&T's Private Message Exchange
 SMTP = Simple Mail Transfer Protocol

This chart includes a representative selection of vendors in the local net operating systems market. Vendors may offer other local net operating systems, and many vendors not included offer a full range of competitive products.

SOURCE: BUSINESS SYSTEMS GROUP, HOUSTON

Local net operating systems

Vendor	Product	Operating system type	Net adapters supported	Supported file server CPUs	File server RAM requirements	Maximum RAM supported (bytes)	Total hard disk storage addressable (bytes)	Workstation OS	Minimum workstation RAM (bytes)	Maximum number of connections per file server	Fault tolerance
Novell, Inc. (continued)	NetWare 386	NetWare	Arcnet, Ethernet, token ring	386 AT	2M, 4M recommended	4G	32T	DOS, MAC (through NLM or bridge), OS/2 (through OS/2 requestor), Unix (through portable NetWare)	2M	250 concurrent nodes	System Fault Tolerant Level I ('hot fix' disk repair), disk mirroring, disk duplexing, supports transaction tracking
Sitka (formerly TOPS) Alameda, Calif. (415) 769-2496	Network Bundle for DOS	DOS	TOPS Flashcard, TOPS Microchannel Flashcard, 3Com 3C503, 3Com Etherlink MC, Western Digital 8003, TOPS Flashcard Toshiba Corp.	PC, XT, AT, 386, PS/2, Toshiba laptops	135K real or 66K real/237K extended	No limit	No limit	DOS	170K real or 86K real/266K extended	20 clients per server	NA
	Network Bundle for Macintosh	Macintosh OS	Any	Mac Plus or above	512K	8M	No limit	Macintosh OS	512K	No limit	Tape backup
Torus Systems, Inc. Redwood City, Calif. (415) 594-9336	Tapestry II LAN Manager	OS/2, DOS	NCR token ring and Starlan, IBM Token-Ring, 3Com Ethernet and token ring, Western Digital Ethernet and token ring	286, 386	640K	16M	4G	DOS, OS/2	640K	No limit	Uninterruptible power supply, tape backup, disk mirroring, disk duplexing
Ungermann-Bass, Inc. Santa Clara, Calif. (408) 496-8111	Net/One LAN Manager 2.0	OS/2	UB's Ethernet and token ring adapters, industry standard adapters	286, 386, 486	5M	32M	48G	DOS, OS/2	512K for DOS, 3M for OS/2	1,000	Uninterruptible power supply, tape backup, disk mirroring, disk duplexing
Waterloo Microsystems Waterloo, Ontario (519) 884-3141	Waterloo Port	DOS	Arcnet and token ring	IBM PS/2, AT	512K extended memory	16M	600M per workstation	DOS, OS/2	384K of extended memory, 640K DOS	1,000	Uninterruptible power supply, tape backup, disk mirroring, disk duplexing

DCB = Disk Controller Board
EDCB = Enhanced Disk Controller Board
ESDI = Extended Small Device Interface
MAC = Media access control
MHS = Novell's Message Handling System

NA = Not applicable
NLM = NetWare Loadable Module
SCSI = Small Computer Systems Interface
SMTP = Simple Mail Transfer Protocol

SOURCE: BUSINESS SYSTEMS GROUP, HOUSTON

(continued from page 35)
Clara, Calif., LAN downtime costs Fortune 500 companies an average of \$3.5 million in lost productivity and more than \$600,000 in lost revenue each year.

Referring to current network management features, Thomas

software only, network monitors can run as programs on workstations or as server-based processes on file servers. These products provide features previously available only with more expensive, proprietary combination hardware/software units called pro-

along the network wire and the amount of data in the packets.

High-end features of network monitors include the ability to set alarms for individual workstations, such as the number of bad frames a workstation has transmitted (presuming an Ethernet topology) or the length of workstation idle time.

The downside of these products is that they typically can't see across network links such as bridges or routers without remote access software. Also, because of the detailed nature of their information, they may provide statistics that are too obscure for the average user to understand.

In addition to network monitors and other software solutions to the network management challenge, hardware solutions are emerging.

For example, network management features are becoming more common in intelligent hubs, which are devices on LANs

ize the hubs' objects, attributes, behaviors and alarms.

As the complexity of LANs increases and as they begin to interoperate with other LANs, the need for adequate network management becomes more serious.

In choosing a LAN operating system, it is important to consider the protocol it uses because network monitors can often provide information on Novell's In-

ing system vendors are working to develop distribution systems for their networks. Their major customers may have 1,000 nodes on their network, creating the need to regress to the centralized MIS distribution network to handle data updates and operating system and application software, as well as to ensure the correct usage of site licenses."

"Software distribution and re-

"Failure mode analysis is the most important area for network management."

▲▲▲

Gilligan, associate consultant for Baxter Healthcare Corp. in Deerfield, Ill., says, "No one really implements network alarms. Most of the time, when you are getting error messages from network alarms, the messages are cryptic or they are about as specific as the red warning light going off on your automobile dashboard indicating engine trouble."

Corporate Networks' Henderson agrees. "Failure mode analysis is the most important area of improvement for network management features," he says. "The maturity of the LAN operating system can be judged by the number of tools available to diagnose these problems. NetWare, for example, has such tools as NetWare Care, and many third parties also provide tools for this purpose."

A sampling of these third-party add-on products includes a new breed of network management software called network monitors. Generally comprising

protocol analyzers.

Some examples of low-end network monitors are Brightwork Development, Inc.'s Emonitor+, which runs as a Value-Added Process on a NetWare 286 server or as a NetWare Loadable Module (NLM) on a NetWare 386 server.

High-end features of net monitors include the ability to set alarms for workstations.

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At the high end, Network General Corp. produces Watchdog, which runs as a program on a workstation. Network monitors provide information such as the instantaneous and average number of packets per second moving

that serve as distribution points for closely grouped workstations. In fact, the IEEE 802.3 Hub Management Task Force is researching standards for Ethernet network management in such devices. The goal is to standard-

Net management features are becoming increasingly common in intelligent hubs.

▲▲▲

egrated Packet Exchange/Sequenced Packet Exchange (IPX/SPX) and IBM's Network Basic I/O System, for example, while they may not be able to provide as much useful information about other proprietary schemes.

Enterprise net management

When LANs begin to interoperate, not only with one another but also with other platforms such as Unix workstations, minicomputers and mainframes, network management must be taken to the enterprisewide level.

Some of the concerns raised in developing an enterprisewide net are software distribution, remote management and security.

According to Ed Curry, president of Lone Star Evaluation Laboratories, Inc. in Austin, Texas, "A few of the major LAN operat-

remote operation are key LAN issues," says Marty Vernick, manager of client/server computing for IBM in Somers, N.Y. "There must be better network management of large networks from a central location. There must be improved ability to run diagnostics remotely before sending someone out to fix the problem. And there is the need for better backup and restore."

Digital Equipment Corp. has made recent advances in these areas of enterprise network management. Remote servers in a DECnet network using the software option for remote system management can be centrally managed for updates to operating systems and applications.

Recent examples of advances in the areas of software distribution and site licenses for LANs in-

(continued from pages 36 and 37)

Maximum number of open files	Number of network printers	Smart disk controllers	Number of bridges	Mainframe connectivity	Remote communications connectivity	OS/2 support	Macintosh connectivity	Electronic mail	Security features provided	Price
100,000	16	DCB, DCB/2, EDCB	Up to 16 internal cards; no limit on external	Gateway, DEC native	X.25 gateway, native asynchronous	OS/2 Requestor	Via bridge or NLM	Supports MHS	Password protection, share levels of access, record/file locking	\$7,995
100	16	NA	NA	NA	X.400, SMTP gateways, other gateways; native TCP/IP support	NA	Native	Inbox	Password protection, share levels of access, record/file locking	\$249
Limited only by Mac OS	No limit	NA	No limit		X.400, other gateways	NA	Native	Inbox	Password protection, share levels of access, record/file locking	\$299
OS/2 limit	7 per printer server	NA	NA, NETBIOS bridges supported	Third-party gateway	Third-party gateways to DEC, X.25, asynchronous	Native	Gateway	Yes	Password protection, share levels of access, record/file locking	\$300 per station
96	32	NA	NA	Third-party gateway	TCP/IP support	Native	NA	NA	Password protection, share levels of access, record/file locking	\$5,995
200 per server	3 per workstation	SCSI, ESDI, ST506	NA	Third-party gateway	Third-party gateway to X.25, and asynchronous	No	Via TOPS	Yes	Password protection, share levels of access, record/file locking	\$495 per user (Port Lite)

This chart includes a representative selection of vendors in the local net operating systems market. Vendors may offer other local net operating systems, and many vendors not included offer a full range of competitive products.

3Com Corp. was unable to provide information in time for publication.

SOURCE: BUSINESS SYSTEMS GROUP, HOUSTON

clude technologies by Novell, Inc. and Brightwork Development.

Before NetWare 2.1X, the update or regeneration of file servers required the use of multiple floppy diskettes. With NetWare 2.1X, however, the floppy diskette regeneration is still an option but if one file server on the network has been updated, all of the file servers on the network can use it to regenerate themselves.

Regarding the issues of site licensing, Brightwork Development has released SiteLock, which runs as a Value-Added Process or NLM that restricts users of applications to the numbers specified in the application's licensing agreement.

Security

Another more fundamental concern that is heightened in the enterprisewide setting is security. LAN vendors have realized the need for security enhancements, and some vendors such as Banyan and Novell already encrypt passwords, data and both tape and hard disk backups.

As the government updates its Data Encryption Standard, many users suspect that enterprisewide net security will ultimately consist of LAN security measures and host-based encryption schemes.

A host-based encryption scheme that implements vendor-specific algorithms would further encrypt data. This is necessary so that the act of breaking into a LAN does not allow access to host data.

Traditional host security products such as Computer Associates International, Inc.'s Top

Secret and IBM's Resource Access Control Facility already provide host-based data encryption or access prevention, whether either originates in the host site or on the LAN. Using these products requires that a LAN user have multiple passwords and identifications for each layer of security.

Perhaps one of the best ways

to deal with enterprisewide network management issues is through global naming schemes, which ensure that changes made on one server are replicated across other servers on the net.

Global naming issues

"Global naming is very important for internetworks and WANs;

things won't fly without it," Corporate Networks' Henderson says. "For example, if you are managing a wide-area network with 30 file servers and you have to change 20 users, you have 600 potential operations to perform [if you don't have] some global naming scheme."

"However," Henderson adds,

"if you can make the required changes once per user, you have saved yourself 580 steps. If you have 150 networks in a WAN with file servers going through bridges and routers, the savings become more than significant."

DataAids' Bush offers Banyan's VINES as an example of a (continued on page 40)

The increasing importance of compatibility

With the introduction of Microsoft Corp.'s Microsoft Windows 3.0 earlier this year, IBM Personal Computer users finally have a graphical user interface and a multitasking environment that can support many of their existing hardware and software investments.

Key players such as WordPerfect Corp. and Lotus Development Corp., which made graphical versions of their WordPerfect and 1-2-3, respectively, for the OS/2 environment rather than Windows, will now have to redesign these packages for Windows 3.0.

Meanwhile, Microsoft's own Word for Windows and Excel packages are rapidly gaining market share.

Microsoft has become a key player in the network field as well. For years, Microsoft has been the hidden force in networking with the Microsoft Network (MS-Net) drivers in the DOS environment.

Now, as Windows 3.0 becomes the environment of choice for as many as two mil-

lion desktop users in the next year, Microsoft's influence in the networking marketplace is expected to increase.

Currently, only a small set of local-area network software is compatible with Windows 3.0, including Banyan Systems, Inc.'s VINES, Novell, Inc.'s Net-

virtual machine capabilities.

Not all features of all network operating systems work in each of these modes.

For example, while Artisoft, Inc.'s LANtastic operating system is almost compatible with Microsoft networks and Windows 3.0, there are a few glitch-

Currently, only a small set of LAN software is compatible with Windows 3.0.



Ware and 3Com Corp.'s 3+ systems. This is due to the fact that Windows compatibility is a complicated proposition. Windows 3.0 has three operating modes:

- Real — the simplest memory-sharing arrangement.
- Standard — allows access to extended memory.
- 386 enhanced — allows multitasking via Intel Corp. 80386

es. LANtastic's disk sharing is possible in standard mode, but printer sharing is not because of an incompatibility with the way Windows 3.0 handles print drivers. In addition, Microsoft does not support running Windows 3.0 in enhanced mode on any nondedicated server running MS-Net.

The other major network

package compatible with Windows 3.0 is LAN Manager 1.0 or 2.0, which Microsoft is marketing to compete directly against NetWare. This sales campaign will target reseller retail outlets and will include additional products such as the SQL Server, a data base server Microsoft jointly developed with Sybase, Inc.

Microsoft is putting together a complete product line to compete better with Lotus, WordPerfect, Ashton-Tate Corp. and other application software vendors. This lineup includes an operating system, graphical environment, applications and LAN operating system.

Welcome to the future of increasingly complex hardware/software interactions and incompatibilities in which a premium is placed on software packages that are compatible with one another and with standard hardware configurations — the true legacy of Windows 3.0.

John McQuillan
President
McQuillan Consulting
Cambridge, Mass.

Operating systems move

continued from page 39

top-flight global naming system. "Every day, the VINES 4.0 network, via StreetTalk Directory Assistance, collects all of the information about the network regarding servers, printers, users, lists, volumes, nicknames and so on," Bush explains. "With one

updated data base always in place, a user logs on to the network, not on any specific server, and basically has access to all resources on any server."

In LAN Manager 2.0, Microsoft has implemented a sort of global naming scheme that uses the concept of domain servers.

One server on the network, known as the domain server, keeps track of the rights to all re-

sources and replicates these over its member servers. Again, users do not have to log on to any specific server to gain access to networkwide resources.

As multivendor situations become more abundant, the demand for common global naming schemes will grow. With the emergence of the CCITT X.500 directory service standards, for example, LAN operating systems

such as VINES and LAN Manager will probably deliver X.500-compliant programs in the near future as a part of the LAN operating system package.

Where do LAN operating systems go from here? As LANs continue to displace minicomputers and mainframes as preferred departmental computing solutions, distributed processing becomes crucial and all computers in the

network play a role in handling the company's information.

Because of these trends, LANs will become faster in the near future and more accessible to all computers, regardless of physical limitations.

Wireless networks will perform at speeds comparable to Ethernets or high-speed token rings and will be a solution for companies with large factories and widely separated departments.

More importantly, networks

LANs will become faster in the near future and more accessible to all computers.



will become "smart." While distributed processing is now planned and set up manually, the networks of the future will be able to tell which workstations are idle and will distribute processing tasks to them on the fly.

This technology, going a step beyond such existing technologies as remote procedure calls, will truly bring distributed processing to every desktop and drastically increase LAN performance.

With these new technologies in place, with advances in management techniques such as global naming and directory services, and with graphical user interfaces for end users, we will see high-speed, distributed, remotely managed, user-friendly networks on the desktops of America and around the world. ■

Letters

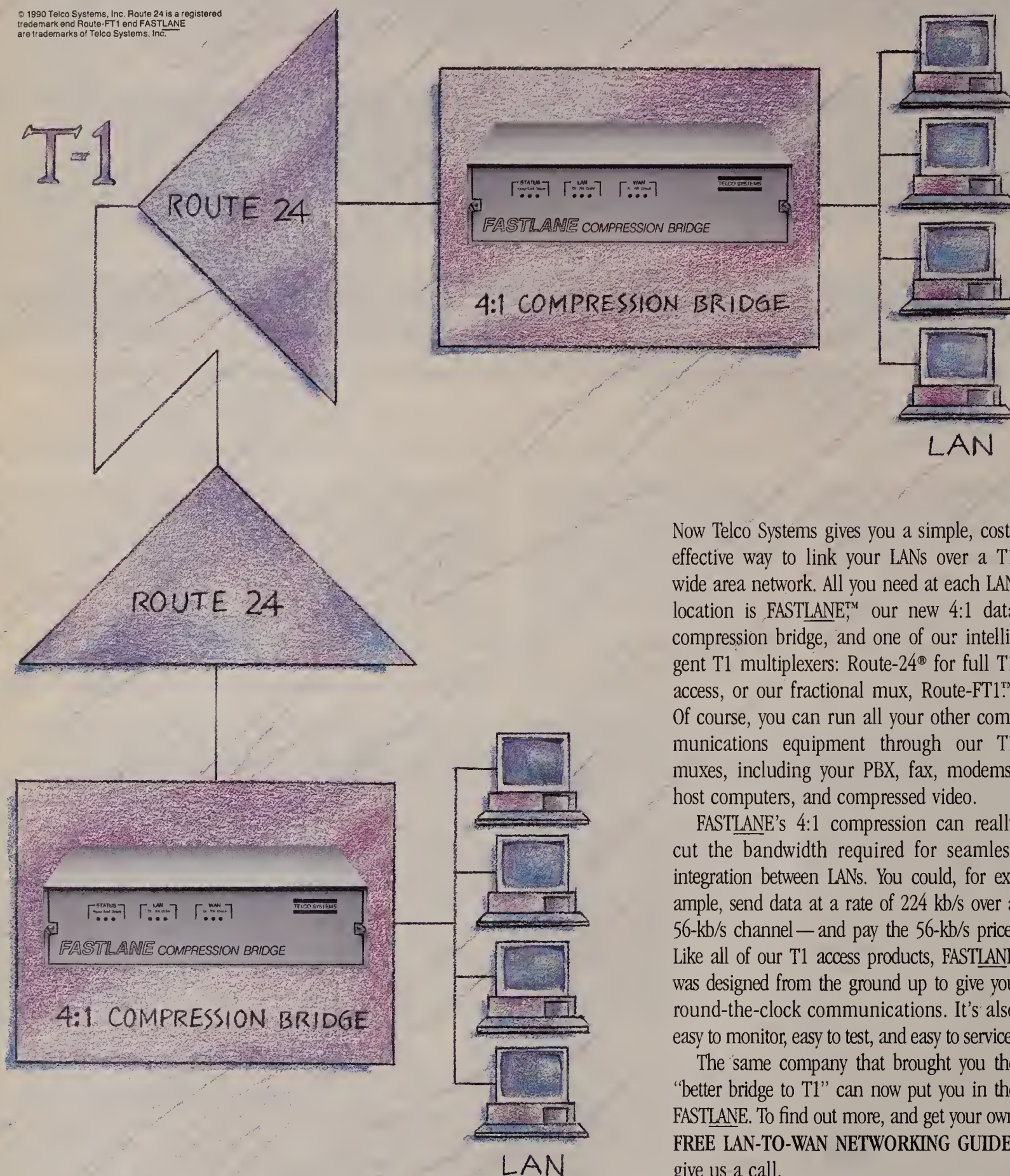
continued from page 33

Such preventive tasks are left to detective and monitoring controls, which in most cases are audit trails that are part of the system design. Remember, the lesson of *The Cuckoo's Egg* by Clifford Stoll was that the break-in was discovered when the books didn't balance, not when information was misdirected.

In summary, I sympathize with the notion that technology alone is not the answer. Security is, after all, a people problem, not a hardware issue.

The solution to this problem, however, does not lie solely with a better class of user, but with a better integration of users and systems that allows the business to function without exposure to undue risk.

John Wylder
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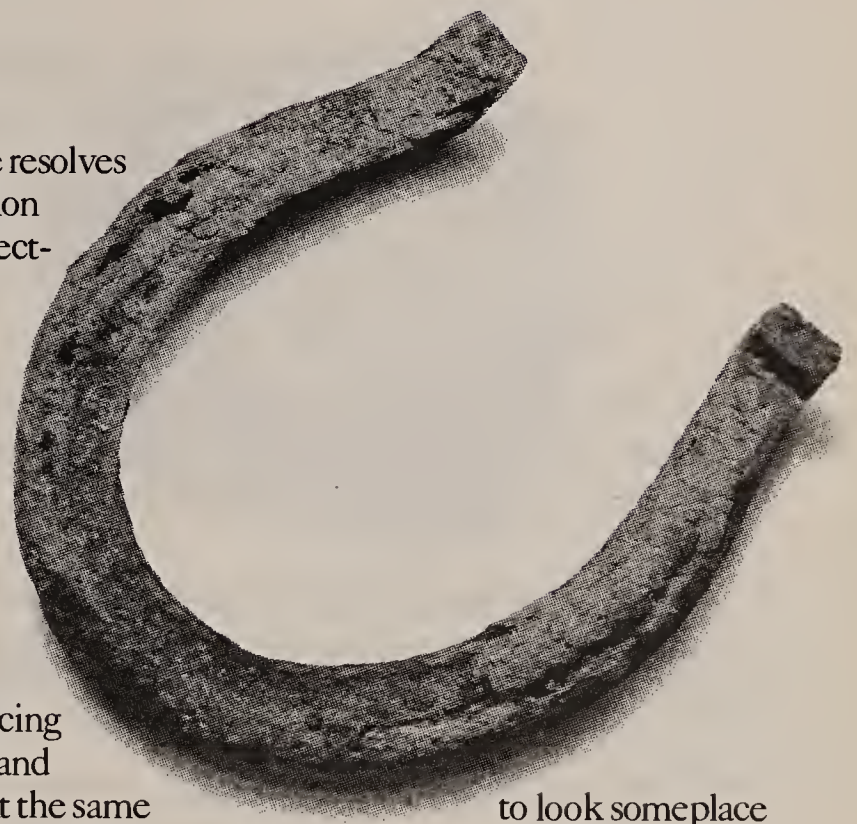
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Wiring hub doubles as server

continued from page 2

a hub in star-wired networks. The device, typically situated in a wiring closet, will support coaxial, twisted-pair and fiber-optic connections to workstations and terminals. Hubs can be interconnected using the same mix of media.

Configuration

The INX5000 has a 13-slot mid-plane bus instead of the usual backplane. This allows for the separation of intelligent logic modules — 10BaseT concentrators and terminal servers — from connection modules, the components that provide the physical workstation or network wire connections.

Separating the two types of modules enabled Racal InterLan

to isolate most of the active components on the logic modules, which can be swapped from the front of the chassis without taking any other module out of service. This reduces the mean time between failure of the less accessible connection modules, which are encumbered with dozens of wire connections.

The mid-plane has two Ethernet buses — Bus A and Bus B. Bus A, the continuation of an external Ethernet, passes traffic between chassis components and provides a connection to an external Ethernet backbone. Bus B is an identical Ethernet bus that always serves as the default path for packets exchanged between modules.

Adding a Network Manage-

ment Module to the basic chassis will enable network administrators to create two subnetworks within the box.

The subnetworks can be maintained separately to isolate certain types of workstation traffic onto one subnet, allowing only the traffic that needs access to the other bus to broadcast across that path.

Interface options

As announced, the INX5000 supports three basic types of interfaces: 10BaseT modules, terminal server modules and Network Management Modules.

The 10BaseT module is used in conjunction with a connectivity module that provides 12 RJ-45 ports. A maximum of 13 10BaseT modules can be configured in a single INX5000, yielding a total of 156 ports. When the Network Management Module is added, the total yield drops to 144 ports.

The 10BaseT module is said to be fully compliant with the IEEE 802.3 repeater specifications, and the company promised that the product will comply with the

final version of the 10BaseT specification for supporting Ethernet over unshielded twisted-pair wire.

The terminal server module is a dual-protocol device that supports Digital Equipment Corp.'s Local Area Transport (LAT) protocols and the Transmission Control Protocol. Dual-protocol support will enable ASCII terminals to access local-area network-attached hosts that support LAT, such as DEC processors running VMS, as well as any TCP/Internet Protocol host.

The terminal server is used in conjunction with a 16-port connectivity module, meaning a single INX5000 can support a maximum of 208 terminal ports without network management or 192 ports with net management.

The Network Management Module is based on an Intel Corp. 80386 microprocessor and is the focal point of all INX5000 network management activities.

At the highest level, this module can be controlled from Racal InterLan's LANcentral Express management station, a Reduced

Instruction Set Computer-based Sun Microsystems, Inc. workstation that centralizes all configuration, monitoring and fault isolation activities. LANcentral uses a hierarchical topology map to configure, monitor and access various statistics at the chassis, module and port levels.

X Window support

Alternatively, net management capabilities can be supported from an X Window System terminal or from an LCD front-panel display on the unit.

Volume shipments of the INX5000 are expected to begin in December. A 13-slot INX5000 costs \$4,250. The terminal server module costs \$2,995, including the LAT and TCP software. The 10BaseT concentrator costs \$2,125, and SNMP network management for that module is priced at \$3,350 per chassis.

The company is also offering a three-slot chassis for \$2,550.

Racal InterLan can be reached by writing to 155 Swanson Road, Boxborough, Mass. 01719, or by calling (800) 526-8255. □

Furniture maker uses EDI

continued from page 2

Dealers that use EDI to order from Haworth will create orders using a personal computer program dubbed Cadvantage III, which Haworth developed. The dealers will then establish a dial-up link into a local node of the IBM Information Network and send the order into an electronic mailbox.

Haworth has programmed its IBM 3090 host to automatically retrieve orders from the mailbox and enter them into Haworth's own order entry system four to six times a day.

In pilot tests with a dozen participants earlier this year, dealers were found to use the system about twice a day. That test also showed Haworth could expect to benefit from EDI by reducing labor costs and time associated with processing orders, Eckel said. Previously, Haworth processed all orders manually.

About 80% of the anticipated \$600,000 in yearly savings will come from reduced labor costs, Eckel said. The time needed to process an order has been cut from as much as four days to less than 24 hours. Other reasons for using EDI include reduced postage costs and eliminating data entry errors.

But the bottom line is that EDI is enhancing Haworth's ability to offer improved customer service, said Richard Haworth, president and chief executive officer of the furniture maker. "Not only will the accuracy and quality of orders improve, but we'll see a reduction in delivery lead times as well," said Haworth, whose company recorded 1989 revenue of about \$500 million.

To encourage participation by the company's dealers, Haworth is assuming hardware, software and transmission costs — about \$1,500 for each trading partner per year — for dealers that commit to sending 100% of their or-

ders electronically.

"Haworth would end up paying a quarter of a million dollars if all our dealers take advantage of this," Eckel said. "But we think it would be worth it."

According to Eckel, the EDI rollout has been successful so far. The major challenge came in converting Haworth's manual method of processing orders to an electronic one.

"There are a multitude of things that a human does that are not the easiest things to observe and understand as they are entering an order," Eckel said, referring to the ability of individuals to recognize color errors or transposed data that Haworth's current EDI system cannot recognize. It took a team effort consisting of MIS, customer service, upper management and dealer service employees at Haworth to bring the project to fruition, he said.

Bucking the trend toward implementing EDI standards, such as ANSI X12, Haworth has decided initially to use an EDI format "that is X12-like," Eckel said.

"The cost associated with implementing standards at this time could not be justified," he said. X12 EDI translation software can cost from \$1,000 to \$3,000 per dealer, with annual maintenance fees from \$300 to \$700.

"That's not an insignificant decision," Eckel said. "If we went with a \$2,000 software package and offered it to 300 dealers, we'd have a big bill."

Haworth plans to start using standards, however, when it begins sending purchase orders to suppliers late this year or early next year. Later on, the company will begin using standards with dealers, too.

Haworth plans to support standards in dealing with its domestic and overseas suppliers and dealers, which means that the company will likely support X12 here and EDI for Administration, Commerce and Transport (EDIFACT) overseas. □



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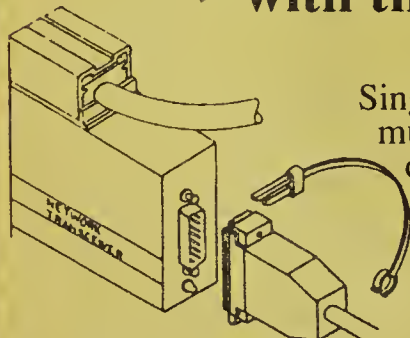
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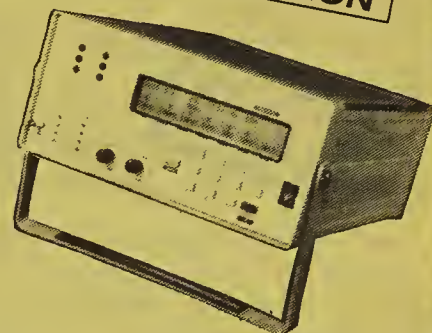
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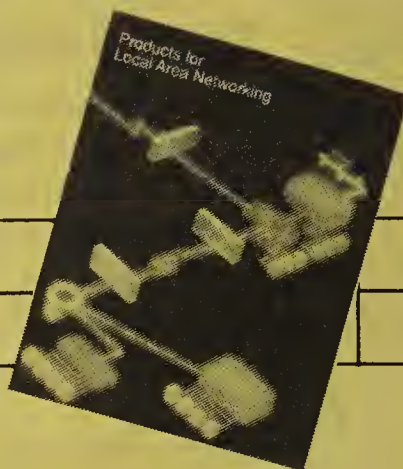
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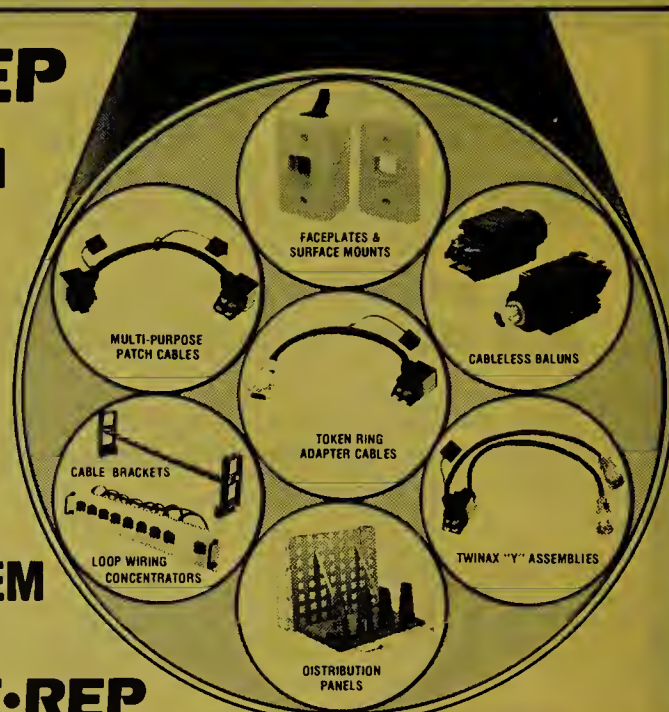
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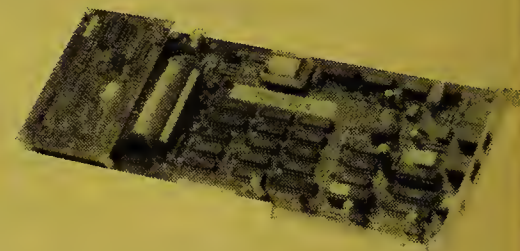
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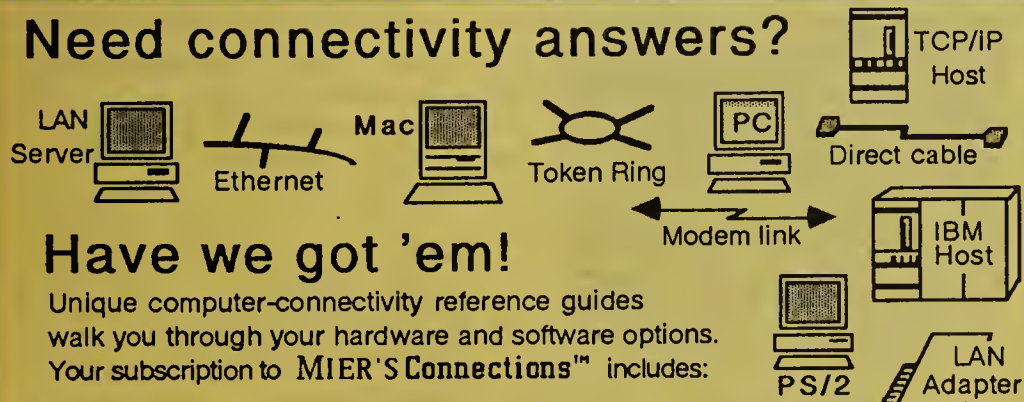
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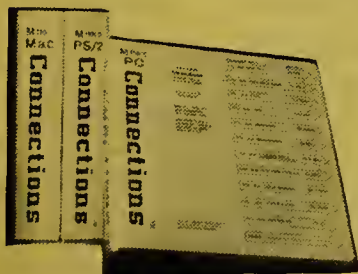
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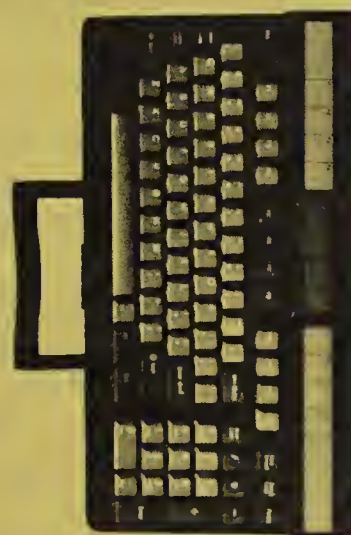
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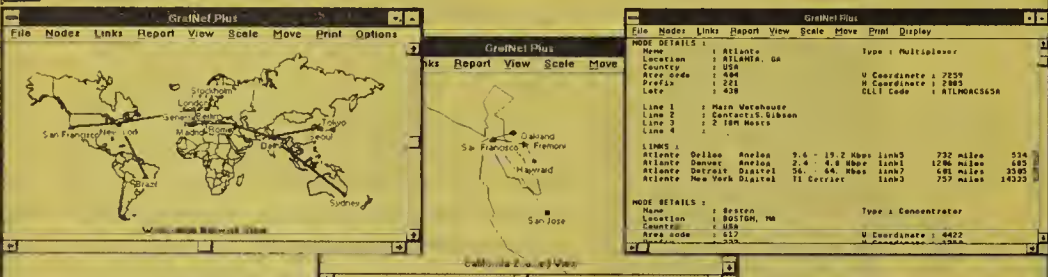
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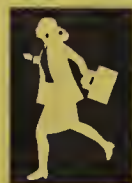
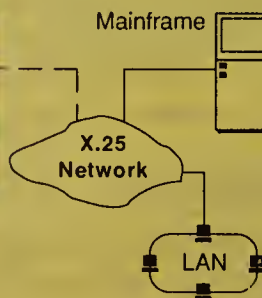
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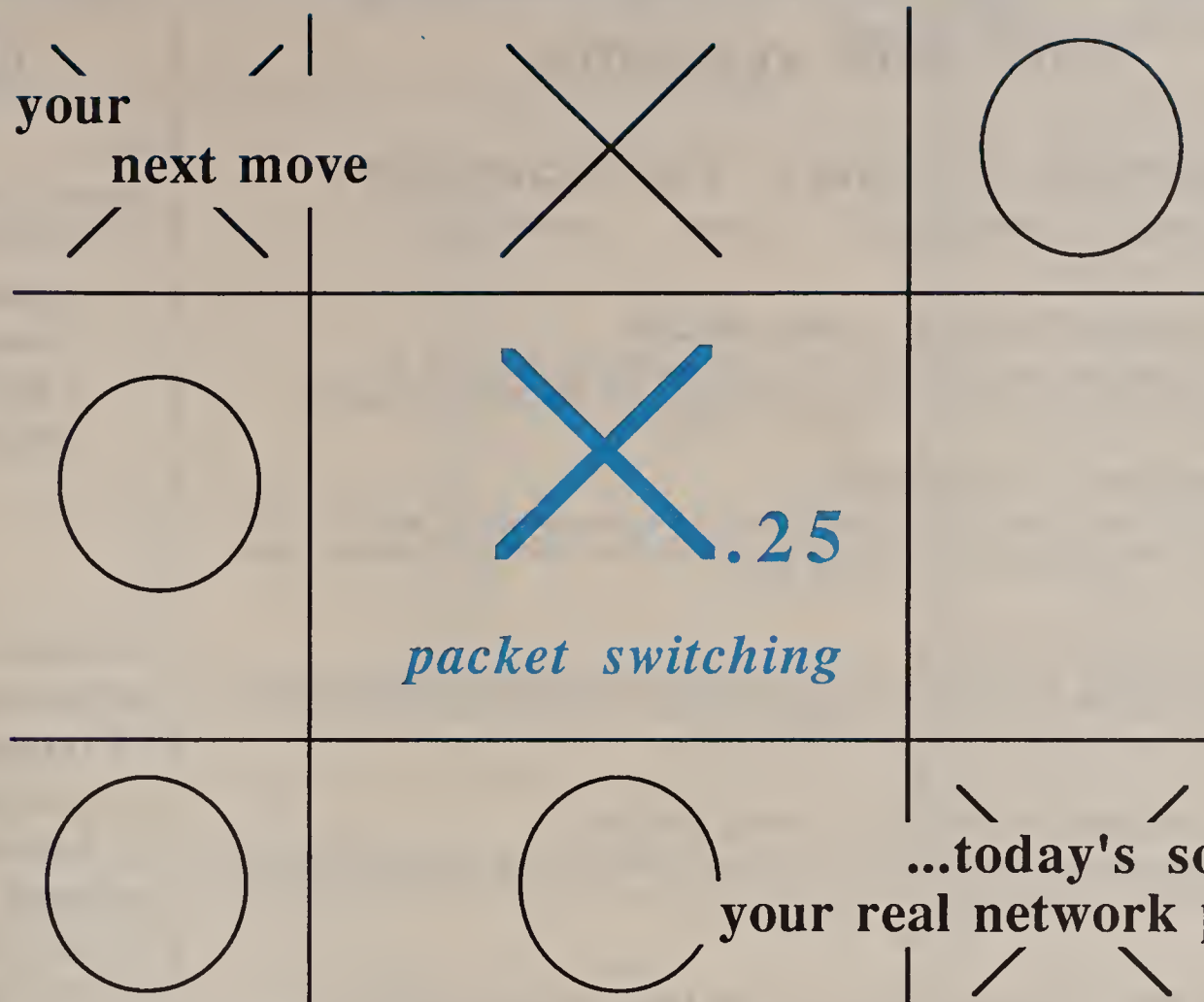
Every week, *Network World* provides information that helps users who design, purchase and implement enterprise networks.

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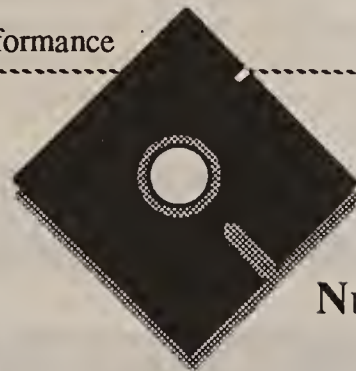
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Your price will depend on the size of your ad. The 1990 1x open line rate is \$8.00 per line or \$112.00 per column inch.

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3 columns x 3"	\$1,008.00
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5 columns x 7"	\$3,920.00

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

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NUMBER OF COLUMNS	MINIMUM DEPTH	WIDTH
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2 columns	2-5/8"	2"
3 columns	4-1/16"	3"
4 columns	5-9/16"	4"
5 columns	6-15/16"	5"
6 columns	8-3/8"	6"
7 columns	9-3/4"	7"

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Health care industry Rx: uniform EDI

continued from page 1

ing groups by making better information available about hospitals' purchasing habits. The purchasing groups, which represent different hospitals, aggregate their purchasing power to negotiate discounts with suppliers.

"This whole venture is precedent-setting," said Roger Cadaret, project leader at the Detroit office of Ernst & Young, the consulting firm developing the EDI Project Team plan.

"In other industries, huge customers have acted individually to drive EDI development," he said. "In this case, we have the unique scenario of a diverse group of customers joining together to specify EDI requirements to suppliers."

The plan, expected to be unveiled to sponsors later this month, could include a recommendation to select a standards-based EDI software package and one or more value-added network providers that would link the hospitals, their buying groups and suppliers.

However, Bud Bowen, executive vice-president for AmeriNet, Inc., a national multihospital buying group in St. Louis, said the plan may wind up recommending a more generic EDI implementation scheme, such as a guideline for suppliers to develop their own order-entry systems.

According to Garren Hagemeyer, the EDI Project Team's coordinator and a national sales manager for the Federation of American Health Systems, "The goal of the study group is to create a common approach to EDI that will provide a level playing field for all hospital groups, distributors and suppliers."

The plan is designed to move the health care industry beyond the proprietary supplier-designed order-entry systems currently used to order supplies ranging from

gauze pads to beds, Hagemeyer said.

Pressure from users

During the mid-1980s, the health care industry's major manufacturers gave hospitals electronic order-entry systems as an incentive to order supplies. Industry members at the time applauded the strategy as innovative and efficient. But the order-entry systems have increasingly come under attack by users for favoring the manufacturers that provide them and failing to conform fully to EDI standards.

"The order-entry system suppliers have felt pressure from users to change, and they have — but they haven't changed enough," Cadaret said.

Industry observers said it is unfair that Baxter Healthcare Corp., for instance,

could gain access to price-sensitive information when handling orders for a competitor's products via its Analytical Systems Automated Purchasing (ASAP) Express order-entry system.

Large suppliers, such as Baxter Healthcare and Johnson & Johnson Services, Inc., are cooperating with the EDI Project Team's efforts to gain the data needed to devise their business plan.

But these suppliers dispute charges that their systems are biased or that they have failed to support EDI standards.

"We support a full implementation of X12," said Sue Scott, director of Baxter Healthcare's ASAP Express system. "And we support a joint user and vendor effort to develop the best order-entry or EDI system." □

MCI pledges switched T-1, T-3 services

continued from page 1

plex modeling or simulation problems, while IBM demonstrated LAN interconnectivity and image transfer applications.

Company officials said the performance of its switched data services will be equal to that of private-line services.

Many details of the promised service, such as where it will be available and exact pricing information, are still sketchy.

MCI plans to begin beta-testing the services with about 10 users by year end to look into the type of applications users want and to iron out operational aspects of the service such as tariffing rates and billing procedures, said Don Heath, MCI's

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vice-president of data marketing.

Pricing structure may be a critical aspect of the new service since it is intended to offer cost-effective, high-capacity facilities for users that only need the links for a few hours at a time.

Heath said the company will attempt to implement a pricing schedule that minimizes service costs even when customer usage temporarily rises above the level at which a dedicated facility would be less expensive.

"Our intention would be to not have [this service cost] infinitely more than a private line. If a customer goes beyond a certain amount of traffic, he only pays a percent above the private-line lease arrangement," Heath said.

MCI officials declined to give any spe-

cific details about pricing since the tariff won't be filed for another six months. But Martin Burack, senior manager of data services product marketing at MCI explained that users will have to pay for dedicated T-1 or T-3 access links in addition to usage charges.

MCI will account for distance sensitivity in its rates, but Burack declined to say whether the switched data services will have separate distance charges. He said that for switched voice, distance is becoming a less important factor in pricing, adding that MCI's pricing strategy for VPDS would mirror that.

MCI said it plans to add new data speeds to its VPDS line, including lower fractional T-1 speeds. The carrier will also support VPDS internationally if there is enough

customer demand, Heath said.

MCI views the new switched data services as building blocks in its strategy to offer a full line of data services. "There's a slew of things coming that are different from what you see today," Heath said.

Total interoperability

If customers want data services based on other technologies, such as fast packet, MCI will add support for those, said Tony Russo, director of data product marketing at MCI. "Our intent is to interoperate with all of the services out there," Russo said.

Heath said MCI is setting its own pace in rolling out data services and denied that the VPDS announcement was prompted by AT&T's recent introduction of its Software-Defined Data Network service, which

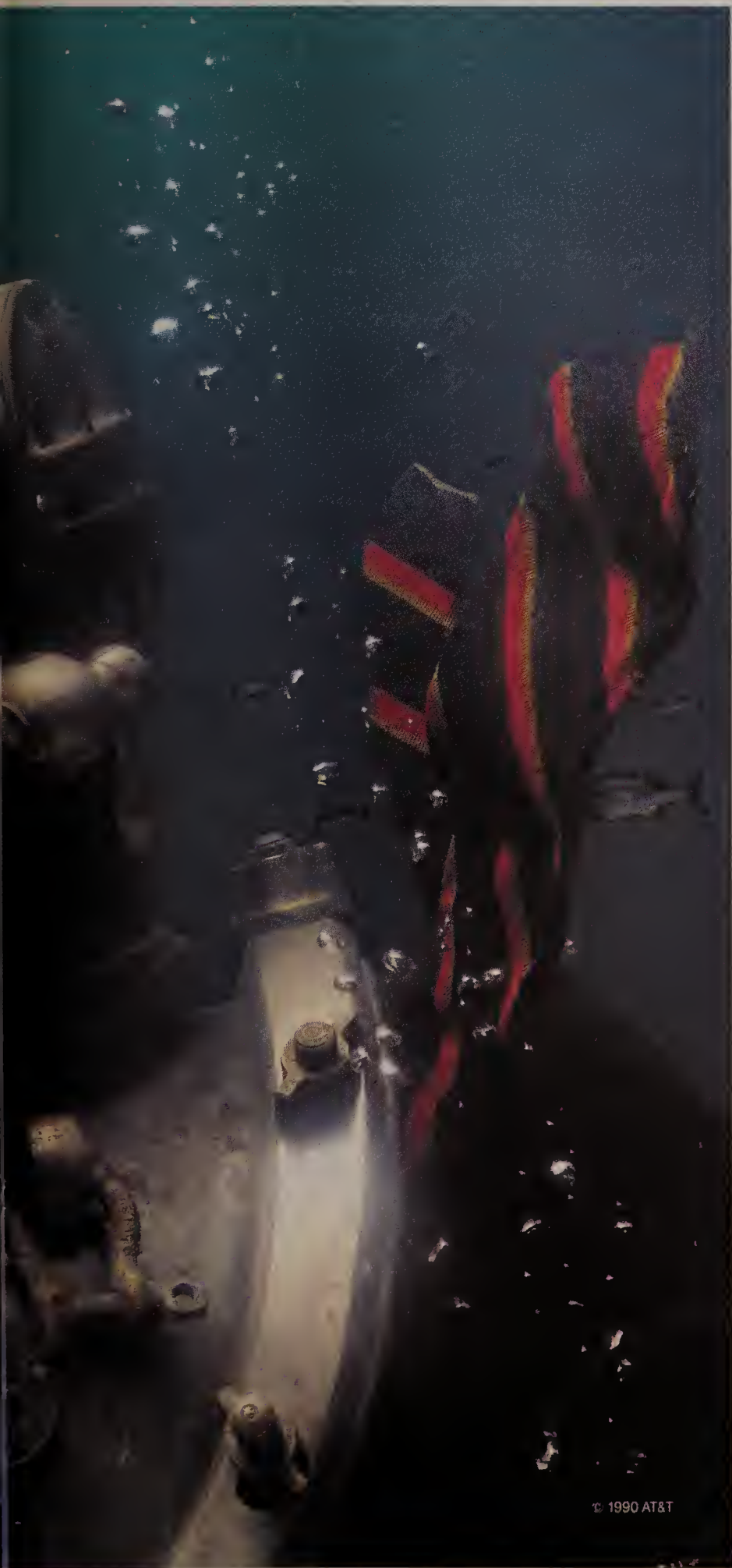
supports switched speeds up to 384K bit/sec. However, he said MCI is hoping to use data services as a vehicle to increase market share.

AT&T is by far the largest provider of data services. It is common to find a customer that has a large percentage of its voice traffic with a carrier such as MCI but has all of its data traffic with AT&T.

Heath said MCI is hoping it can entice some customers of other vendors to switch to MCI based on its arsenal of data offerings, as well as entice existing customers to turn over their data services to MCI.

"We've got to offer something more that can attract not only the existing data communications users but people who will use data communications because of what we're providing," Heath said. □

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Newbridge card uses idle T-1 bandwidth

continued from page 2

In a mesh network, those circuits will follow different routes — of varying lengths — to reach the same destination in the network, raising the possibility of propagation delays. However, a Virtual Channel Card at the receiving end synchronizes incoming data.

In the past, users with small segments of unused bandwidth on different T-1s could not aggregate them to support a high-bandwidth application, according to Jim Michaels, assistant vice-president for network planning at Newbridge. Consequently, they would have to add T-1 or fractional T-1 links for specific applications, he explained.

The card costs \$4,500 and is expected to be available by year end.

Accumaster link

Newbridge also last week announced 5606 MainStreet ACMI, software that allows its 4605 MainStreet net management system to pass alarms to AT&T's Accumaster Integrator. AT&T certified the 5606 software for compatibility with Accumaster Integrator.

The 4605 MainStreet software is an OS/2-based net management system that can be used to direct all Newbridge products, including multiplexers and bridge/routers.

The link to AT&T's integrated net control system will enable users to monitor and control Newbridge devices from an Accumaster Integrator workstation, rather than maintaining separate management consoles.

The 5606 MainStreet ACMI costs \$10,000 and is expected to be available by year end.

Newbridge also improved the net management capabilities on its 4602 MainStreet NetworkStation, a Unix-based net management system that also manages all Newbridge devices.

The new management software, Release 3.0, supports dynamic rate adaption whereby the software can alter channel speeds to adapt to changing network conditions. For example, failure of a T-1 link might prompt voice calls or certain data applications to receive a larger portion of the existing bandwidth and cause lower priority traffic to receive less bandwidth.

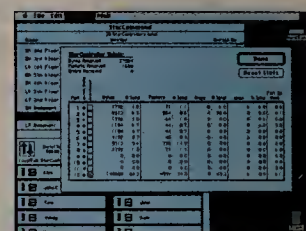
The 4602 MainStreet NetworkStation software is priced between \$8,000 and \$250,000, depending on the number of nodes and the network capacity. The software is expected to be available by year end. □

Our new StarController has reliability written all over it.



Reliability starts here. The new PhoneNET StarController® Series 300 has just the right amount of output voltage: $\pm 3.5V$, the same as a Macintosh. Any more and you get noise, electrical reflections, and "crosstalk"—electrical phenomena that can make a network unreliable.

Even when everything else is down, you're up. The Series 300 external



Management Bus operates outside of the rest of the network, giving your Macintosh data about the network even when a network is down. StarCommand™ software monitors port status automatically, and notifies the manager about problems for both LocalTalk and Ethernet networks. Plus, you get network diagnostics and traffic analysis.



LEDs provide a reliable way to shed light on port status and signal quality. The Series 300 detects jamming, automatically removes malfunctioning nodes from the network, and puts them back when the problem is cleared. It's the only hub that reports noise problems. The Series 300 delivers lots of data about each port, and even maintains port status during power failures.

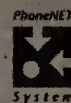
When you're down to the wire, the Series 300 works reliably with twisted pair, quad cable or 25-pair cable. Which means you can build a reliable network in any building anywhere. The Series 300 amplifies and repeats

LocalTalk signals over 12 ports, up to 48 offices. Each port will support 3,000 feet of cable to Apple computers and peripherals, and other LocalTalk-compatible devices.

A name you can rely on for reliable networks. Farallon invented networks over telephone wire. Easy installation, economy and reliability have made the PhoneNET System the standard for AppleTalk networks. And our technical support is widely recognized as the best in the business. No wonder there are more than a million PhoneNET nodes installed.

Farallon

PhoneNET
StarController
Series 300



Reliability has its mark. Our first generation of StarController hubs is still performing reliably for over 400,000 users—with less than 1% failure in three years. The PhoneNET® System logo is your assurance that the Series 300 will perform to specifications. It guarantees that the Series 300 is compatible with the entire PhoneNET System family of network products, including the StarController™ EN for use on Ethernet networks. And it assures you of extensive, high-quality documentation on network design, technical specs, and management and troubleshooting help.

For the name of the Farallon dealer nearest you, call Customer Service at (415) 596-9000. Dealers call our Reseller Hotline 1 (800) 344-7489.

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